

# CSBA

Center for Strategic and Budgetary Assessments

# FOCUSED FORCE

CHINA'S MILITARY CHALLENGE  
AND AUSTRALIA'S RESPONSE



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2025

## **ABOUT THE CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS (CSBA)**

The Center for Strategic and Budgetary Assessments is an independent, nonpartisan policy research institute established to promote innovative thinking and debate about national security strategy and investment options. CSBA's analysis focuses on key questions related to existing and emerging threats to U.S. national security, and its goal is to enable policymakers to make informed decisions on matters of strategy, security policy, and resource allocation.

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## ACKNOWLEDGMENTS

The authors are indebted to many individuals for their unstinting support to this research project. Special thanks to the Australian and American workshop participants who shared their time and wisdom with the research team. Their enthusiasm and deep engagement during the rebalancing exercises were indispensable to the completion of this final report. The authors are grateful to Travis Sharp and Tyler Hacker for their counsel on key aspects of the operations research that produced the report's analytic findings. Many thanks to Tom Mahnken, Evan Montgomery, and Lee Goddard for their invaluable feedback on an earlier draft of the report. The authors would like to recognize Madison Creery, Eleanor Hughes, and Joseph Ross for their diligence throughout the project, including coordinating the workshops in Washington and Canberra. The authors are especially thankful to Madison, who conducted the initial research, updated the rebalancing tool, shaped the structure of the workshops, provided the postexercise analysis, and synthesized the results from the exercises.

**Cover graphic:** A Royal Australian Air Force F-35A sits on the tarmac at Luke Air Force Base, AZ, July 30, 2018. Credit: Staff Sergeant Jensen Stidham, USAF. Disclaimer: the appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.

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# Executive Summary

The Center for Strategic and Budgetary Assessments (CSBA) conducted force structure rebalancing exercises in Washington, D.C., and Canberra to examine how the People's Liberation Army (PLA) might evolve over the next decade and how the Australian Defence Force (ADF) could respond to the PLA's challenges. The exercises brought together leading defense thinkers and practitioners from Australia and the United States to serve as active participants. Using CSBA's force planning tool, exercise participants developed alternative PLA and ADF force structures over the coming ten years and explored interactions between the PLA and the ADF. The goals of the exercises were to assess Australia's long-term threat environment and provide insight into how the ADF could navigate its force planning challenges.

The PLA rebalancing exercises yielded a considerably modern force that was far better suited for joint operations by the mid-2030s. Reductions in the PLA Ground Force helped fund increases in the quality, range, and lethality of the PLA Air Force and PLA Navy, reorienting the PLA from an army-centric force to a power projection force. All exercise teams chose to increase stockpiles of long-range, precision-strike missiles. All teams also improved jointness, interoperability, and sensor networks. Most teams elected to invest in undersea warfare to challenge longstanding U.S. and allied advantages in that domain. The exercise teams judged that the rebalanced PLA would weaken U.S. alliances, furnish Beijing with tools to coerce Indo-Pacific countries, threaten Australia's sea lanes and territory, and increase the chances of defeating the United States in a war.

The ADF rebalancing exercises produced a force that could better implement Australia's deterrence-by-denial strategy by the mid-2030s. The exercise teams equipped the ADF with offensive and defensive capabilities for deterring China and, if necessary, intercepting hostile forces approaching Australia's shores in wartime. They increased the ADF's long-range strike capability across the kill chain by connecting precision-strike munitions to a network of space-, sea-, and air-based sensors. The teams also addressed what they saw as a glaring gap in Australia's air and missile defense architecture.

The teams built a stronger defensive posture in northern Australia, hardening infrastructure and fuel storage facilities while expanding military construction. Investments in logistics and basing positioned Australia to sustain U.S. operations, increase the size of the U.S. presence, and increase bilateral and multilateral military exercises. Finally, the teams enhanced Australia's ability to produce and sustain vital capabilities, particularly munitions, strengthening its sovereign defense industrial base. The exercise teams concluded their rebalancing decisions put the ADF in a more competitive position to engage in a high-end conflict in the Indo-Pacific theater.

The exercises collectively uncovered analytic themes and assumptions that should inform future decision-making. The PLA rebalancing exercises raised a series of questions and issues concerning: (a) Beijing's sense of urgency or lack thereof regarding the potential use of force against Taiwan, (b) the durability of Australia's sanctuary status vis-à-vis Chinese long-range strike, (c) the PLA's global ambitions and their implications for Australia's defense, (d) the degree to which the allies will maintain their undersea superiority into the 2030s, and (e) China's accelerating nuclear modernization and its impact on U.S. extended deterrence. The trendlines would appear to point in a worrisome direction across all five areas.

The ADF rebalancing exercises also brought to the forefront themes and assumptions about Australia's future military roles and force structure choices. The teams uniformly opted for a strategically defensive but tactically offensive posture to neutralize incoming threats against the Australian homeland. They also preferred investments that enabled U.S. forces to conduct a wide array of operations, including novel options to facilitate rotational presence. All exercise teams were committed to fielding a conventionally armed, nuclear-powered submarine force, but most exhibited deep ambivalence about the prospects of the SSN-AUKUS submarine program. All the teams confronted stark and painful trade-offs, owing to the leanness of the ADF's force structure and inherent resource constraints.

To add value to the exercise teams' exchanges about long-range strike, CSBA conducted an independent, scenario-based analysis to examine how Australian policymakers should consider their options. CSBA studied various long-range strike capabilities, using their capacity to deliver firepower as a measure of their relative efficacy. The strike options included F-35 fighters, P-8 maritime patrol aircraft, surface combatants, and the planned *Virginia*-class nuclear-powered attack submarines. CSBA also incorporated hypothetical options, namely B-21 Raider stealth bombers, intermediate-range ballistic missile units, and forward-based F-35s, in its analysis. CSBA provided a balanced assessment of the advantages and handicaps of each strike system and concluded the B-21 stood out for its capacity to deliver payload as measured by weight.

## CHAPTER 1

# Introduction

Military competitions, like wars, are inherently interactive: one side does its best to outdo its rival and vice versa. This dynamic is most evident in the Indo-Pacific, where China's military ascent has triggered countervailing responses across the region. In recent years, Australia, Japan, the Philippines, Taiwan, and other neighbors have rolled out a series of security and defense initiatives with the People's Liberation Army (PLA) and Chinese paramilitary forces in mind. Frontline states have unveiled their new plans and projects at a breathtaking frequency and pace.

To assess this interactive phenomenon, the Center for Strategic and Budgetary Assessments (CSBA) launched a research project examining China's military modernization and its implications for Australian force planning in the mid-2030s. This focus on a longer-term time horizon takes into account the enduring influence of decisions made today. It is also meant to help policymakers transcend immediate day-to-day demands and consider their options with their eyes fixed on the future. This research project acknowledges that the PLA's metamorphosis will be a permanent fixture in Asian politics and will exert a lasting impact on the strategic balance.

CSBA convened two force rebalancing exercises, one in Washington, D.C. and one in Canberra, to simulate the PLA's modernization trajectory over the next decade and Australia's corresponding choices over the same period. The goal was to test how Canberra could best respond to and mitigate the expected challenges from China's ongoing military transformation. The exercises brought together leading defense thinkers and practitioners from both sides of the Pacific to generate policy- and strategy-relevant insights. This final report lays out the logic of the research project, recounts the major decisions and debates during the two exercises, and offers independent analysis and findings from the exchanges among Australian and American participants.

## The PLA's Increasing Strength and Australia's Force Planning Challenges

General Secretary Xi Jinping has set forth an ambitious aim to turn the PLA into a “world-class military” by midcentury. The Chinese military has accordingly embarked on a major modernization drive, including a massive buildup that U.S. officials and analysts have called a “wartime footing.”<sup>1</sup> At sea, the PLA Navy (PLAN) boasts the world’s largest navy by hull count and has steadily procured a blue-water navy, including such platforms as aircraft carriers, amphibious assault ships, cruisers, and nuclear-powered submarines. On land, the PLA Rocket Force (PLARF) fields the largest conventional ground-based missile force in the world and boasts a diversifying nuclear arsenal. It is poised to further expand its family of hypersonic weapons and intermediate- and intercontinental-range missiles. In the air, H-6 bombers from the PLA Air Force (PLAAF) armed with long-range land-attack and anti-ship munitions can threaten various targets across the region. The forthcoming H-20 stealth bomber will make stand-off attacks from the air even more credible. The PLA’s improvements in offensive space and cyber capabilities provide additional non-kinetic means to threaten its rivals.

At the same time, Australia has begun a historic strategic reorientation and force modernization that will lead to major changes in its armed forces’ operational concepts, force structure, posture, and capabilities that are necessary for long-term great power competition in the Indo-Pacific. Australia’s 2023 Defense Strategic Review (DSR) made a series of recommendations for how the Australian Defence Force (ADF) could reform in light of its more dangerous strategic environment. The Australian Army plans to undertake significant organizational changes. Its three army brigades had been organized and equipped primarily for deployments to the Middle East. The Department of Defence has announced the Army would reorganize to focus on littoral operations and long-range fires.<sup>2</sup>

The Royal Australian Navy (RAN) has proposed major force structure changes to adapt to the new circumstances. Following a review of the RAN’s surface combatant fleet, the Anthony Albanese government agreed to purchase six more *Hunter*-class frigates, up to 11 new frigates, and multiple large optionally crewed surface vessels (LOSVs) in place of smaller vessels that would have lacked the survivability, range, and lethality to operate in a contested maritime environment farther from Australian shores.<sup>3</sup> Plans to acquire conventionally armed nuclear-powered submarines through the AUKUS framework are proceeding

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1 See Chief of Naval Operations (CNO), *Navigation Plan for America's Warfighting Navy* (Washington, DC: U.S. Navy, 2024), p. 6, <https://www.navy.mil/Leadership/Chief-of-Naval-Operations/CNO-NAVPLAN-2024/>; Seth G. Jones, “Beijing Is on a Wartime Footing,” *Wall Street Journal*, January 1, 2024, <https://www.wsj.com/articles/beijing-is-on-a-wartime-footing-defense-industrial-base-shipbuilding-16e22a87>.

2 Julian Kerr, “Marles Details Army Restructure,” *Australian Defence Magazine*, October 12, 2023, <https://www.australiandefence.com.au/defence/land/marles-details-army-restructure>.

3 Australian Department of Defence (ADoD), *Enhanced Lethality Surface Combatant Fleet: Independent Analysis of Navy's Surface Combatant Fleet* (Canberra, Australia: ADoD, 2024), <https://www.defence.gov.au/about/reviews-inquiries/independent-analysis-navy-surface-combatant-fleet>.

apace. The ADF expects to put to sea a fleet of up to eight submarines, bolstering the RAN's ability to operate at extended ranges with superior endurance.

These ambitious plans and programs will take time to bear fruit. The Army's reorganization is expected to take some years to complete.<sup>4</sup> The Army will not receive its Redback infantry fighting vehicles or upgraded Abrams main battle tanks in full until 2028–2029, and the 18 littoral maneuver vessels will not all be delivered until 2037.<sup>5</sup> The RAN faces a similarly long timeline. The first *Hunter*-class frigate will not enter service until 2032, and its first *Virginia*-class submarine will not be delivered until that same year.<sup>6</sup> The long lead times for its various equipment programs suggest Canberra may have to assume greater risks as it fields new capabilities in the short term, from the late 2020s into the mid-2030s, and to find measures to mitigate those short-term risks. This dilemma is not unique to Australia. The United States also faces pressures as its armed forces undergo a capacity trough through the remainder of the 2020s into the early 2030s.

In addition to timing, difficult decisions about the allocation of scarce resources amid competing demands, a universal challenge, will consume policymakers' attention and political capital. Australia plans to spend US\$37 billion on defense in fiscal year (FY) 2025, a sizeable increase from previous years. Yet difficult tradeoffs will be necessary, given the expense of procuring and sustaining big-ticket defense items, especially a fleet of nuclear-powered submarines.<sup>7</sup> Determining what programs and capabilities might have to give way to more pressing priorities will likely be an element of the long-term defense planning process.

ADF modernization plans will also be developed in context with the Australia–U.S. alliance. Policymakers will need to strike a delicate balance between the need to acquire independent, sovereign capabilities and the benefits of relying on certain U.S. military capabilities and its defense–industrial base. American and Australian officials will need to address questions about the division of labor within the alliance, decide how to pool and maximize their shared resources, and set expectations regarding the extent to which they can assist each other in peace and war.

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4 Kerr, "Marles Details Army Restructure."

5 ADoD, *2024 Integrated Investment Program* (Canberra, Australia: ADoD, 2024), p. 54, <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

6 Daniel Darling, "Australia Aims to Double Its Naval Fleet. Can Its Plan Work?," *Defense One*, May 1, 2024, <https://www.defenseone.com/policy/2024/05/australia-aims-double-its-naval-fleet-will-its-plan-work/396246/>; Megan Eckstein, "Here's When the US Navy Plans to Sell Subs to Australia under AUKUS," *Defense News*, November 16, 2023, <https://www.defensenews.com/naval/2023/11/13/heres-when-the-us-navy-plans-to-sell-subs-to-australia-under-aukus/>.

7 Gordon Arthur, "Australia Unveils Record \$37 Billion Defense Budget," *Defense News*, May 15, 2024, <https://www.defensenews.com/global/asia-pacific/2024/05/15/australia-unveils-record-37-billion-defense-budget/>.

## **Project Methodology: In-Person Exercises in Washington and Canberra**

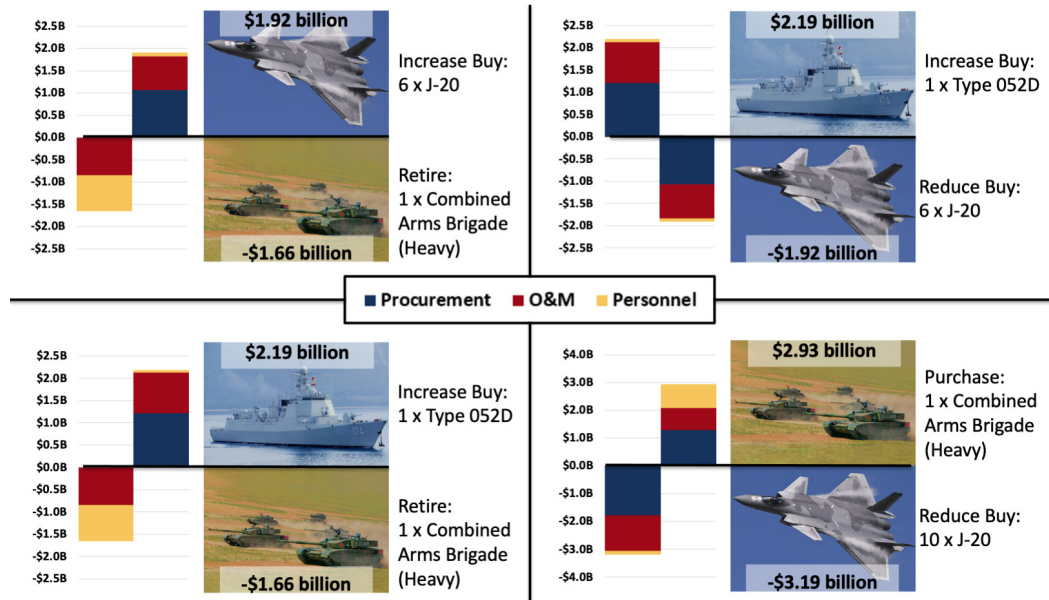
To assess Australia's long-term threat environment and provide insight into how Australia's military can navigate its force planning challenges, CSBA organized a set of interactive exercises. CSBA held two Strategic Choices Exercises (SCEs)—one in Washington, DC, in March 2024 and the other in Canberra in May 2024—to examine ways that the PLA force structure may evolve over the next decade and to assess alternative ADF force structures and postures in response to those changes. The exercises employed the Strategic Choices Tool (SCT), CSBA's one-of-a-kind web-based force planning interface, to develop alternative PLA and Australian force structures over the coming ten years and explore the interactions between the PLA and the Australia-U.S. alliance. These interactive exercises, which used two national SCTs in an action–reaction sequence, were the first of their kind since CSBA began to conduct SCEs over a decade ago.

### **Strategic Choices Exercise Structure and Inputs**

CSBA's SCEs provide a framework for participants to assess alternative strategies, concepts, and force structures for a country's military. During an SCE, participants are divided into small teams, each of which is asked to assess a country's strategic priorities, operational challenges, and capability tradeoffs. After reaching a working consensus on those driving issues, the teams use the SCT to develop alternative force structures over a ten-year period (e.g., 2025–2034) within a given budget constraint. The exercise is structured so the participants can explicitly discuss, debate, and connect a country's ends, ways, and means.

This study's exercises featured CSBA's SCT databases for the PLA and the ADF. The China and Australia SCTs allow users to make budget-constrained trade-offs in projected force structure and modernization spending over the coming decade for the PLA and ADF. The SCTs are not meant to predict the sizes and types of forces China and Australia could field over the next ten years. Rather, the tools are used to identify the possible range of choices, constraints, and opportunities that Chinese and Australian decision makers will likely confront while modernizing their military forces. In other words, the tools are a means to facilitate discussion and debate about the future that, in the process, generate policy-relevant insights and recommendations.

**FIGURE 1: AN ILLUSTRATION OF POTENTIAL TRADEOFFS IN PLA FORCE STRUCTURE**



Source: Created by CSBA.

As a starting point, the China SCT and the Australia SCT each contain a projected force structure over the 2025–2034 period (see Appendices A and B). In the China SCT, the projection is an unofficial estimate of the PLA’s program-of-record force structure based on CSBA’s cost-informed estimation methods, which assume a three percent annual real growth rate.<sup>8</sup> The Australia SCT force structure projection was developed using official documents, such as the 2023 DSR, the 2024 National Defence Strategy (NDS), and the Integrated Investment Program (IIP), as well as interviews with experts inside and outside the Australian government.<sup>9</sup> Participants could adjust the default projections in the China and Australia SCTs by choosing from among hundreds of investment and divestment options to produce alternative PLA and Australian force structures given budget and industrial base constraints.

### Exercise Participants

To conduct the exercises, CSBA convened a diverse group of Australian and American participants hailing from government, defense industry, the military services, and academia. These individuals boasted wide-ranging expertise that encompassed strategy, operational concepts, force planning, alliance management, the Australia-U.S. alliance, the ADF, and the PLA. Each

<sup>8</sup> CSBA developed the China SCT through a multiyear research project to estimate Chinese program-level defense costs and to project China’s future force structure. For more detail on the cost estimation and force structure projection methodology, see Jack Bianchi, Madison Creery, Harrison Schramm, and Toshi Yoshihara, *China’s Choices: A New Tool for Assessing the PLA’s Modernization* (Washington, DC: Center for Strategic and Budgetary Assessments, 2022).

<sup>9</sup> Although the Washington SCE was held prior to the public release of the 2024 NDS and IIP, these documents did not significantly alter CSBA’s default force structure projection in the Australia SCT.



exercise involved approximately 20–24 participants who were assigned to three teams of six to eight participants based on their specific skillsets and professional backgrounds.

To encourage a frank and free-flowing conversation among the participants, the workshop discussions were not for attribution. Given the potential sensitivities of the topics involved, many of which remain works in progress within the American and Australian national security community, non-attribution was crucial to the exercises' success. For the purposes of this report and in accord with non-attribution, participants' contributions have been kept strictly anonymous.

### **Tasking and Guidance – Day 1: Assessing the Threat Environment**

On Day 1, participants were divided into three teams and tasked to serve as an advisory group subordinate to China's Central Military Commission. In other words, the participants were asked to step into the shoes of Chinese decision makers and defense planners. Each team was charged with developing an alternative future PLA force structure designed to achieve China's security goals within a defense budget constraint. Before rebalancing the PLA's future force structure and capabilities, the teams were asked to address six foundational questions:

1. What are China's strategic objectives?
2. What operational challenges does the PLA need to address to advance its strategic objectives?
3. How and to what extent does Australia figure into China's strategic- and operational-level calculations, assessments, and decision-making?
4. In China's military competitions with likely adversaries, what critical operational-level asymmetries—both favorable and unfavorable—are relevant to the PLA's force planning?
5. To achieve China's objectives, what force attributes and key capabilities are required?
6. What near- and long-term tradeoffs and risks should Beijing be willing to accept?

These questions required the teams to develop a consensus on China's strategic priorities and link those priorities to military concepts and capabilities. Once consensus was reached, teams used the SCT to rebalance PLA force structure accordingly. After the teams rebalanced their forces, CSBA convened a plenary session during which team representatives briefed each other about their decisions. The Q&A session during the plenary allowed the teams to defend—and to be held accountable for—their choices before the entire group.

### **Tasking and Guidance – Day 2: Assessing Alternative ADF Force Structures**

On Day 2, the participants—assigned to the same teams as on the previous day—were tasked to serve as members of an independent review team advising the Australian government. The teams were instructed to assess and propose changes to Australia's force structure to

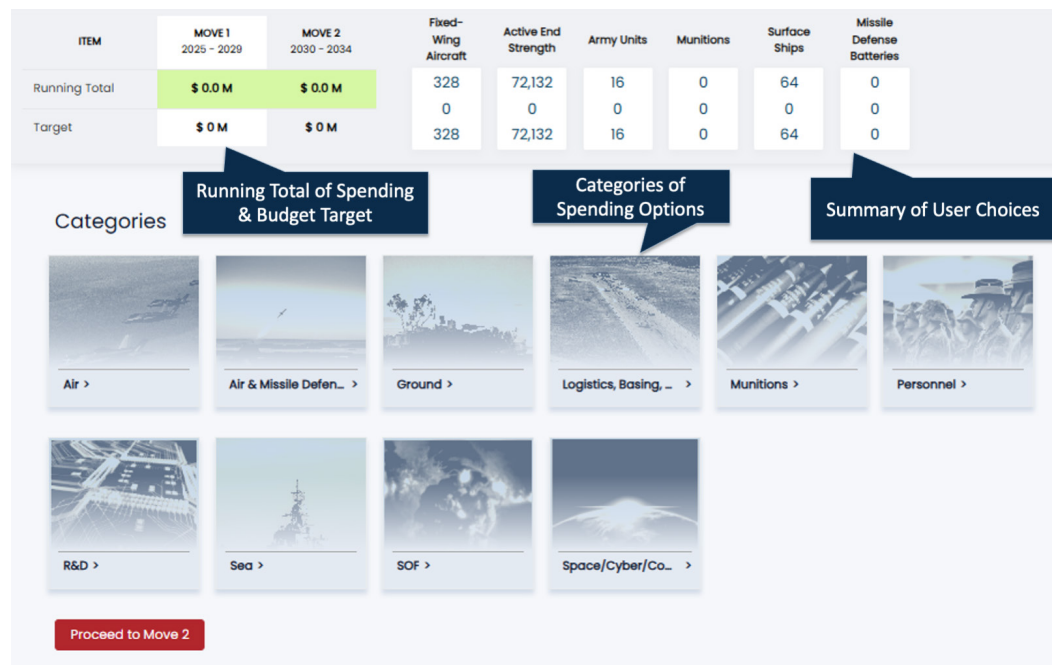


advance its national security goals based on the respective teams' assessment of Canberra's strategic objectives. As they made their Day 2 decisions, the teams were tasked to consider the alternative PLA force structures they had developed during the China SCEs on Day 1. The goal was to ensure the participants were linking or relating their choices to the potential PLA challenges they had identified. Before using the Australia SCT, participants were asked to find common ground on the following six questions:

1. What are Australia's primary strategic objectives?
2. What operational challenges must be overcome to meet Canberra's strategic objectives?
3. What operational-level asymmetries—favorable and unfavorable—are relevant to achieving Australia's objectives?
4. How does Australia view the Australia–U.S. alliance?
5. To achieve the stated objectives, what force attributes and key capabilities are required?
6. What near- and long-term tradeoffs and risks should Canberra be willing to accept?

After making their force structure decisions in the SCT, teams were tasked to explain how their choices could impact the Australia–U.S. alliance division of labor and to revisit their critical assumptions about alliance dependencies and redundancies.

**FIGURE 2: HOMEPAGE OF THE ADF STRATEGIC CHOICES TOOL**



Source: Created by CSBA.

On Day 2, following the Australia SCE, CSBA moderated a separate roundtable discussion focused on key issues in the Australia–U.S. alliance. The teams were asked to answer the following questions:

1. What is AUKUS? What are the merits of AUKUS for Australia? For the United States? What should the trajectory of AUKUS look like over the next 10–15 years?
2. What type of allied and partner presence in Australia would advance the team's strategy? What Australian and allied overseas posture options would advance the team's strategy and the team's allied strategy?
3. Which capabilities should be built indigenously? Which imported platforms need to be sustained indigenously? Where might allied coproduction be desirable given costs, risks, time constraints, etc.?

As on Day 1, after the discussion, the teams joined a plenary session during which team representatives explained and defended their choices before the entire group. The plenary provided an analytically valuable opportunity for the teams to grill each other about their decisions and discuss differences in approach and in thinking about their rebalancing efforts.

### **Analytic Value of the Exercises**

The questions set forth in the exercises were meant to generate focused discussions and debates. They were also open ended enough for the teams to think creatively about the PLA's and the ADF's future choices. There were no right or wrong answers to these questions. The teams—made up of experienced former and active practitioners as well as thought leaders in the national security community—were free to frame their objectives, develop strategies, and shape their forces as they saw fit. They were also free to rebalance their forces in directions that were radically different from current or expected trajectories for the Chinese and Australian armed forces.

The participants were permitted to invest and divest forces in any way they wished, as long as their defense budgets were balanced at the end of every five-year move over ten years—meaning they were not allowed deficits and were allowed minor surpluses. This freedom of maneuver gave team members permission to reconsider choices and options that might be politically controversial or infeasible in the real world. The purpose was to illustrate the opportunity costs and trade-offs confronting policymakers in Beijing and Canberra and produce policy- and strategy-relevant insights.

### **Postexercise Outputs and Analysis**

For the exercises in Washington and Canberra, CSBA dedicated an in-house team of experienced rapporteurs to facilitate the group discussions, help the teams rebalance the PLA and the ADF, and, most importantly, record the conversations and debates as the teams

answered the questions. The CSBA team engaged in a two-step analytic process after each exercise to capture and draw upon the insights from the rich discussions and eye-opening exchanges that took place among the participants.

First, the program manager of CSBA's SCT aggregated and synthesized the data from the rebalancing exercises by each team. The manager tracked hundreds of investment and divestment choices to discern patterns in team decisions and to pinpoint major divergences in outcomes. The major adds and cuts to the force structures of the teams were then compiled into charts and graphs, many of which are displayed in this report. The aggregated data became a foundational element of the analysis in this report.

Second, immediately after both exercises, the CSBA team revisited the notes meticulously taken by the rapporteurs to identify recurring analytic themes, major areas of consensus, key points of contention, and insights that had not been mentioned in the ongoing policy discourse about Australia's security environment, threat perceptions, and future choices. CSBA subjected these postexercise outputs to scrutiny, and this assessment informed the analysis and key findings in this report.

The next chapter will summarize the teams' answers to the questions posed to them during the exercises and their decisions about force structure and posture for the PLA and the ADF over the next decade. Chapter 3 will identify and sum up the analytic themes that emerged from the rebalancing exercises and interrogate the team decisions and the assumptions underlying them. Chapter 4 will zero in on Australia's plans for long-strike capabilities and weigh the various options through a rigorous scenario-based, operational-level analysis. Chapter 5 will offer concluding thoughts about crosscutting themes that emerged from the workshops and how future rebalancing exercises could be structured to produce additional policy-relevant insights.



## CHAPTER 2

# Team Perceptions and Decisions

CSBA organized three teams for each exercise in Washington, D.C., and Canberra. Over two days, the team members were tasked with rebalancing the PLA on Day 1 and the ADF on Day 2 in an interactive process. The participants made choices for the ADF that were based on their earlier decisions about the shape and direction of the PLA over a ten-year period. This chapter captures the discussions among the teams about the policy objectives and strategies they set forth for the PLA and ADF. This chapter also summarizes the force structure and posture choices the teams made as they rebalanced the PLA and ADF. Given the vast amount of ideas exchanged and the numerous adds and cuts made in the SCTs, the following focuses on areas of consensus among the teams and identifies differences in team choices that were strategically and operationally consequential.

### **China Strategic Choices Exercises**

As the first step in the exercise, each team assessed the PLA's strategy, missions, and capabilities that would be required over the next ten years to realize the People's Republic of China's (PRC's) security objectives. Team decisions in the China SCT are not predictions of the future. Rather, they are hypotheses about the types of threats, including the most serious ones, the PLA may pose to Australia over the next decade and beyond. The following highlights the various areas of consensus and disagreement among the teams.

#### **PLA Strategy: Prioritize Regional Objectives, Weaken the U.S. Alliance Network, and Conduct Limited Global Power Projection**

Among the primary strategic objectives established by the teams, all six groups agreed that maintaining the Chinese Communist Party's (CCP's) political monopoly was the top priority, from which all others flowed. The teams concurred that the PLA is, first and foremost, the armed wing of the CCP, and that the PLA's prime directive is to guarantee the CCP's survival.

All six teams focused on the PLA's local missions, paying special attention to China's territorial objectives in the Western Pacific. They agreed the PLA must possess a force capable of imposing China's will in its neighborhood. Their chief goals were to achieve regional dominance; to settle territorial disputes over Taiwan, the East China Sea, and the South China Sea in Beijing's favor; and to push the United States out of the region or, at a minimum, substantially erode American power and influence across the Indo-Pacific. All teams viewed Taiwan as the top strategic priority, although they preferred to deter Taiwanese independence through nonmilitary means. At the same time, all teams sought to develop a force that could win in a conflict over Taiwan, if necessary, meaning they would attack the island only if compelled to do so. The teams did not set a timetable to conquer Taiwan over the next decade.

All teams focused on disrupting the U.S. alliance network and delegitimizing the American-led order in the Indo-Pacific region. All teams sought to undermine alliance cohesion by having the means to deter U.S. intervention in future regional conflicts and to reduce the credibility of U.S. security commitments in Asia. Three teams explicitly aimed to convince U.S. allies and partners not to come to the aid of the United States in potential conflicts.

The teams concurred that the Chinese military must project power farther into the Pacific and beyond. The goal would be to extend China's strategic depth outward, thereby keeping threats as far from the coastal urban centers—the engines of Chinese economic growth—as possible. The teams believed the PLA's power projection requirements decreased in proportion to the distance from China's shores. In this view, the PLA would invest most heavily in capabilities meant for operations in the Western Pacific and would develop forces for the broader Indo-Pacific as its next priority. It would dedicate resources to worldwide operations as the third and final set of priorities. In other words, the teams conceived of the PLA's geographic scope in three concentric layers that expanded outward from the Chinese mainland to encompass the Western Pacific, the Indo-Pacific, and beyond.

The teams differed over the missions for—and the likely scale of—PLA power projection. They often identified the need to defend sea lines of communications (SLOCs), preserve stable access to overseas trade to spur Chinese economic growth, and shore up resilience against disruptions to global supply chains. Four teams saw defense of overseas interests and strategic SLOCs as priorities. Only two teams, however, invested in an increased PLA footprint overseas. These two teams invested in commercial port access for naval vessels and in construction of large-scale overseas military bases, akin to the base in Djibouti, that would be able to sustain various types of PLA platforms and operations.

### **Priority PLA Missions: Long-Range Strike, Joint Operations, and Conventional and Nuclear Deterrence**

All teams prioritized choices that would sharpen the PLA's ability to conduct high-end conventional operations and coerce the United States and its allies and partners. Two of

the most common aims were to deter Taiwanese independence and U.S. intervention in regional conflicts.

In general, the teams doubled down on military capabilities meant to place U.S. and allied forces and bases at risk. These capabilities included long-range surface-to-air, surface-to-surface, and anti-ship missiles supported by sophisticated sensors. These can find, track, target, and hit enemy aircraft, warships, basing infrastructure, command posts, facilities, communication centers, sensors, and so forth. In defense parlance, these capabilities form an anti-access/area denial (A2/AD) network intended to raise an adversary's costs of operating in or near areas the PLA deems critical to its own purposes. To increase the lethality and geographic scope of this network, all six teams identified theater-range strike as the top priority. Each group's force structure choices typically involved investments in a blend of PLARF platforms and long-range munitions to increase the PLA's reach and capacity.

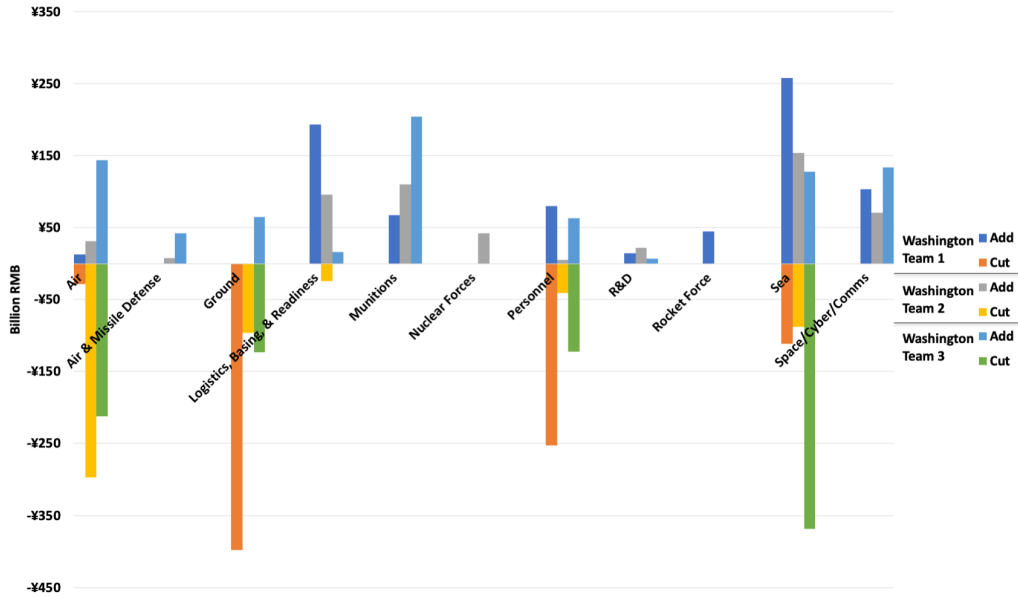
Another priority was to enhance the PLA's ability to conduct joint operations. Given that China fields a large air force and navy, the teams sought to improve its ability to connect and coordinate these services in a contested environment. Most teams invested to improve the services' collective ability to find and attack adversary forces. Several teams reasoned that joint operations would enable the PLA to threaten U.S. forces at greater distances and thus increase the likelihood of deterring American military intervention.

All six teams listed credible nuclear deterrence as a priority mission. Their rationales for nuclear modernization included the need to increase the CCP's survivability, possess means for signaling, deter U.S. or allied intervention in conflicts, discourage mainland strikes, and wield a credible escalatory option. Despite widely shared faith in the power of the ultimate weapon, the teams lacked consensus on what the specific missions and force structures should look like. Most teams chose to maintain the China SCT's default trajectory for the PLA's nuclear forces. Only two teams invested in nonstrategic nuclear capabilities.

### **Desired PLA Capabilities: Preparing for a High-Intensity Conflict**

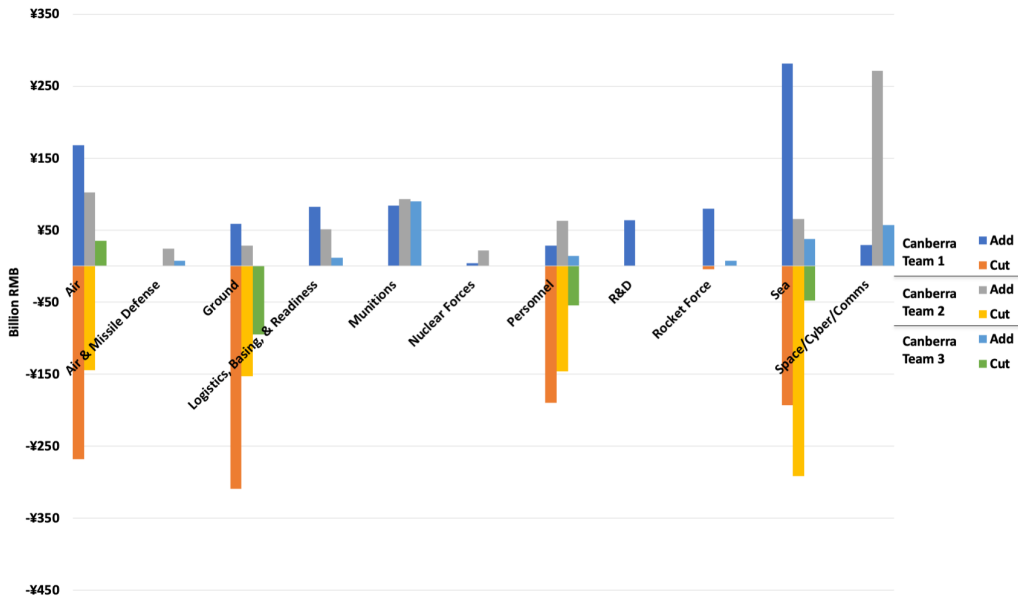
The teams' choices reflected their concerns about a high-intensity conflict with the United States. Although all teams preferred using nonmilitary means to achieve China's strategic objectives, each team recognized the need to develop a force that could win if deterrence were to fail. The teams selected a broad range of capabilities to achieve China's goals. Some recurring choices among the teams included munitions, readiness, undersea systems, command and control, and sensors.

**FIGURE 3: WASHINGTON TEAMS' PLA REBALANCING RESULTS**



Source: Created by CSBA.

**FIGURE 4: CANBERRA TEAMS' PLA REBALANCING RESULTS**



Source: Created by CSBA.



## Preparing for the High-End Fight: Munitions and Readiness

All teams chose to increase stockpiles of conventional missiles and dual-capable missiles that can carry conventional and nuclear warheads. Most teams hedged against the possibility of a protracted conflict that would consume large quantities of munitions. One team wanted to have ample reserves for a massive opening salvo and for sustained volleys of firepower in a long war. The teams focused on PLARF ground-launched missiles. All teams increased hypersonic DF-17 medium-range ballistic missiles (MRBMs), and four teams procured additional DF-26 intermediate-range ballistic missiles (IRBMs). Several teams indicated they would have increased research and development funds and procurement for the DF-27—a developmental missile that reportedly will have a range between 5,000 to 8,000 kilometers—if that option had been available in the China SCT at the time of the exercise.<sup>10</sup>

The teams acquired large quantities of maritime strike munitions to target U.S. and allied naval surface forces. Four teams invested heavily in long-range anti-ship missiles, averaging an increase of over 1,000 missiles, on top of the projected buys built into the China SCT. Five teams bought containerized missile systems, which fit weapons and communications suites inside standardized shipping containers. Described as portable missiles in a box, containerized missiles can be carried by naval and commercial vessels. Containerized missile systems can be employed in various ways, though teams tended to procure them as an offensive capability that could be transported and positioned anywhere. They could, for example, blend into the mass of containers and container ships in a commercial port.

The teams uniformly viewed the PLARF as the primary service responsible for China's strategic nuclear deterrence. They focused on the service's ground-launched dual-capable missiles for fulfilling the nuclear mission. Beyond PLARF dual-capable missiles, two teams invested in dual-capable air-launched ballistic missiles (ALBMs), and one team invested in submarine-launched ballistic missiles. Only two teams developed low-yield nuclear warheads. Only one team aggressively procured ground-, sea-, and air-launched nuclear-capable cruise missiles. Members of this group argued fielding nonstrategic nuclear weapons could reduce the likelihood and potential scale of U.S. intervention, suggesting a readiness to engage in brinkmanship. They also reasoned that capability might dissuade the United States from striking the Chinese mainland.

In assessing combat readiness, the teams judged that the PLA's lack of operational experience and insufficiently educated personnel were major sources of concern to the Chinese high command. These weaknesses were particularly worrying to the teams given their need to prepare for a high-end fight against the United States. To address these perceived

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<sup>10</sup> Several participants in both the Washington and Canberra exercises explicitly voiced an interest in developing and acquiring DF-27 missiles. On the DF-27's potential range, see Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2024), p. 65, <https://media.defense.gov/2024/Dec/18/2003615520/-1/-1/0/MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA-2024.PDF>.

weaknesses, five teams increased funding for training and exercises to test concepts, train realistically, and maintain combat readiness. Two teams increased the operational tempo and readiness of the air and naval services as they continued to grow over the next decade.

### **Contesting the Undersea Domain**

All teams acknowledged the U.S. Navy's enduring qualitative advantage in the undersea domain. Most teams chose to invest in a range of offensive and defensive undersea warfare capabilities to challenge America's longstanding undersea superiority. In other words, they were no longer willing to cede this area of military competition to the United States and were prepared to contest America's unrivaled position in the coming decade.

Five of the six teams listed anti-submarine warfare (ASW) capability as essential for degrading the U.S. and allied edge in undersea warfare. Their common investments included airborne ASW assets, seabed sensors, and mines. Five teams invested in, on average, six littoral sensor arrays to monitor China's coastal areas. Three teams procured the KQ-200 aircraft for anti-submarine operations and maritime surveillance, and three teams invested in sea mines to defend the approaches to critical Chinese ports.

The Washington-based teams were more ambitious about ASW than their Canberra-based counterparts. The Washington-based groups were inclined to invest in the entire ASW kill chain, the capabilities required to find, track, fix, and attack enemy submarines. They bought such capabilities as the KQ-200 ASW aircraft and strike-capable unmanned underwater vehicles (UUVs). The Canberra-based groups, by contrast, were more focused on instrumenting the seafloors to enhance detection of enemy subs.

In terms of offensive undersea capabilities, four teams developed a conventional submarine-launched hypersonic cruise missile, and three teams chose to develop and procure a nuclear-powered guided-missile submarine that is a modified version of the Type 096 strategic ballistic missile submarine (SSBN). Two teams procured an average of three additional nuclear-powered attack submarines (SSNs), on top of the 10 SSNs in the China SCT's default projection for 2024–2034.

### **Increased Coordination and Integration**

Nearly all teams identified PLA shortcomings in jointness; interoperability; and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) networks. They believed the PLA must overcome these weaknesses to win future conflicts. Teams in both SCEs invested across the information, space, and cyber domains, though they varied in scale. Three teams stood out for their large investments in theater battle networks and datalinks. One of those teams sought to develop a highly networked force with C4ISR resiliency across domains. All teams invested in space-based surveillance, communication, and positioning, navigation, and timing systems. The teams procured satellites for ISR and military communications and/or rapid-reaction microsattellites to enhance resilience

in wartime, when an enemy may target such assets. Three teams pursued satellite jamming technologies. All six teams increased general funding for computer network operations.<sup>11</sup>

### Bill Payers and Key Uncertainties

The SCEs required all teams to balance the defense budget at the end of the ten-year investment period. In other words, all investment costs had to be offset by corresponding divestments. To finance their force structure priorities and investments, the teams had to decrease expenditures in areas where they were willing to accept more risk. The most common capabilities the teams were willing to forego in exchange for funding their preferred options were legacy air and sea forces, army units, and ground force modernization. Some teams viewed certain platforms, like aircraft carriers, as expensive luxury items meant to burnish the CCP's prestige. They thus divested from them to generate savings for other priorities. The teams lacked consensus on how best to shape their nuclear forces, preferring to either fall back on the tool's default projection of the force size or rely on the dual-use character of the land-based missile force to bolster nuclear deterrence.

### Reducing Legacy Air and Sea Forces

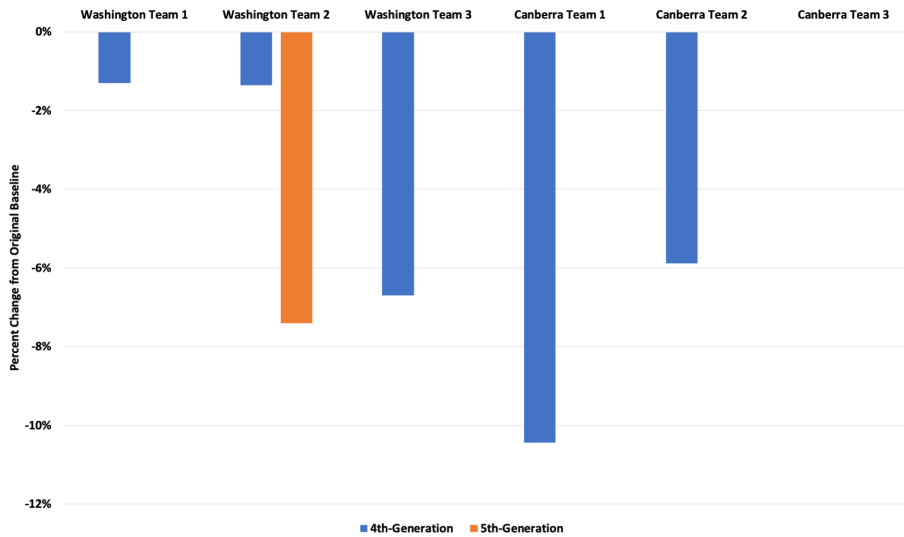
All teams shed what they considered to be excess legacy capacity in the air and sea domains to fund their priorities. In the air domain, five teams chose to reduce or retire fourth-generation fighter aircraft, by an average of 100 fighters, about a 5 percent reduction in the planned fourth-generation fighter inventory.<sup>12</sup> Teams that chose to retire or delay an aircraft carrier commonly reduced the planned procurement of the J-15 carrier-based fighter aircraft and the supporting air wing. Only one team reduced fifth-generation fighter aircraft, targeting both the J-35 carrier-based fighter and the J-20 fighter. This team reduced J-35s by two squadrons due to the retirement of an aircraft carrier and decreased J-20 procurement by 60 airframes. The team judged that the China SCT's default projection of J-20 procurement exceeded the number of aircraft the PLA needed in likely conflict scenarios.

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11 The China SCT options for this exercise were created prior to the SSF's disbandment. Teams chose to increase funding in the former SSF Network Systems Department, but this selection should be viewed as a proxy for investment in offensive and defensive computer network operations forces and capabilities. For more information on this PLA reorganization, see Michael Dahm, "A Disturbance in the Force: The Reorganization of People's Liberation Army Command and Elimination of China's Strategic Support Force," *The Jamestown Foundation*, April 26, 2024, <https://jamestown.org/program/a-disturbance-in-the-force-the-reorganization-of-peoples-liberation-army-command-and-elimination-of-chinas-strategic-support-force/>.

12 Chinese aircraft generations differ from Western ones. Aircraft considered fourth generation by Western standards are regarded as third generation by Chinese analysts. Similarly, fifth-generation aircraft in the West are considered fourth-generation aircraft in China.

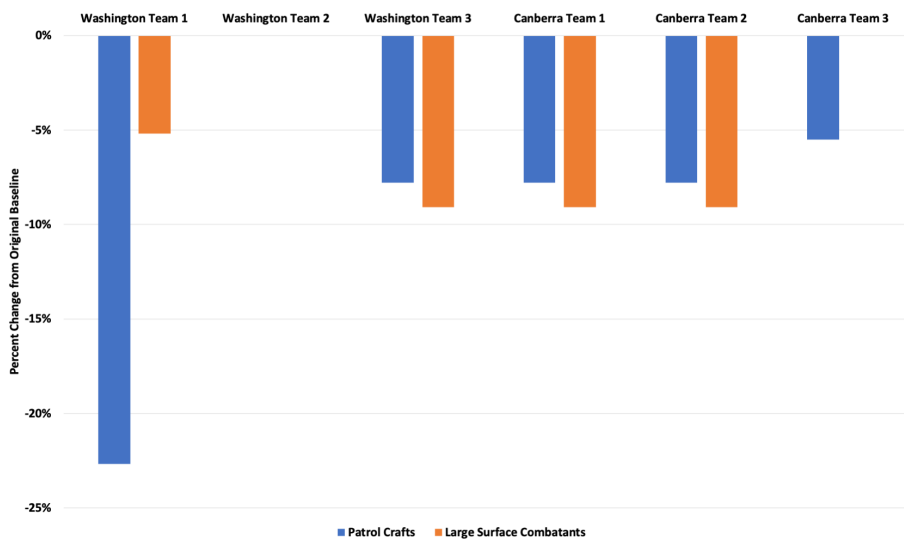
**FIGURE 5: CUTS TO PLA'S 4TH- AND 5TH-GENERATION FIGHTERS**



Source: Created by CSBA.

In the sea domain, five teams divested legacy surface combatants, which were viewed as excess capacity. Four teams cut older patrol and coastal combatants, including the Type 037 patrol craft and the Type 062 submarine chasers/gunboats, reducing patrol vessels by an average of 13 craft. Older Russian-made destroyers were also decommissioned, including the modified *Sovremenny*-class destroyers. On average, the teams reduced legacy destroyers by six ships. By cutting these older air and sea platforms, the proportion of modern platforms in the PLA's inventory increased.

**FIGURE 6: CUTS TO PLA'S PATROL CRAFT AND LARGE SURFACE COMBATANTS**



Source: Created by CSBA.

## **Cutting Army Expenditures**

All teams were willing to reduce PLA Ground Force (PLAGF) spending. Certain capabilities were viewed as less relevant to achieving China's high-priority strategic objectives. The teams commonly scaled back PLAGF modernization and disbanded units. From among the PLAGF's largest combat units—heavy, medium, and light combined arms brigades (CABs)—all teams concentrated their cuts on heavy CABs, paring them back by a quarter, about nine brigades. Most teams judged that future contingencies, such as a Sino-Indian border war or a conflict on the Korean Peninsula, would call for light or mechanized infantry due to complex terrain where armor would be less relevant. These cuts, on top of repeated downsizings of the PLAGF over the last several decades, showed that teams were willing to accept greater risk along China's continental periphery.

These cuts reflected a willingness to accept domestic risk, given the PLA's role as the ultimate guarantor of the CCP's survival and monopoly over political power. Although all teams listed regime stability and party dominance as primary strategic objectives, the teams generally believed the People's Armed Police and other constabulary forces would be adequate for internal security.

## **Prestige Versus Operational Value: Carriers, Bombers, and SSBNs**

Several teams considered investing in high-cost power projection platforms, including aircraft carriers, bombers, and SSBNs, and debated their value in terms of the prestige they conferred on China and their operational utility. Across both exercises, four teams chose to reduce, retire, and/or cancel aircraft carriers. Three teams chose to retire the Type 001 carrier; one of them also retired the Type 002 carrier. One team chose to delay the Type 004 nuclear-powered aircraft carrier (CVN). That team believed the PLAN did not need another carrier, particularly given the cost of developing and procuring a CVN.

Four teams chose to maintain the China SCT's default procurement rate for the H-20 bomber, and one team decided to increase H-20 procurement by two bombers. The team that chose to delay the Type 004 carrier also delayed the H-20 program, given the program's high cost and the team's belief that those funds could be better spent elsewhere. Finally, despite debate within some teams about the prestige and operational value of SSBNs, none altered their inventory.

## **High Uncertainty about Nuclear Force Structure and Modernization**

Although all six teams specified strategic deterrence as a high priority, they did not reach a consensus on the direction of PLA nuclear modernization, including force structure and munitions inventory. During the exercises, three teams chose to increase the PLARF's force structure beyond the China SCT's default projection. All three increased hypersonic dual-capable DF-17 MRBM units by an average of four brigades. Rather than increase the size of the PLARF, all six teams preferred to increase missile stockpiles, primarily through the

procurement of dual-capable DF-26 and/or DF-17 missiles. In general, all teams prioritized investments in the PLARF over the sea and air components of the nuclear triad. The teams were primarily interested in how these dual-use missiles contributed to the conventional strike mission rather than to nuclear deterrence. In other words, they saw nuclear deterrence largely as a by-product of the buildup in dual-use delivery systems.

As noted above, only two teams invested in nonstrategic nuclear weapons, with both developing and procuring low-yield nuclear warheads. One of them chose to develop and procure ground-, ship-, and air-launched nuclear cruise missiles.

### Team Self-Assessments of Their Choices

Across the two exercises, the teams believed they made considerable strides in transforming the PLA into a modern military. The historically army-centric PLA continued its transition toward a force better suited for joint operations. Reductions in the PLAGF helped fund increases in the quality, range, and lethality of the PLAAF and PLAN. The teams judged that the rebalanced PLA would weaken U.S. alliances, furnish Beijing with tools it could use to coerce Indo-Pacific countries, threaten Australia's SLOCs and territory, and increase the likelihood of U.S. defeat in a conflict with China.

## Australia Strategic Choices Exercises

The PLA rebalancing exercises helped the teams think through how the operational environment might evolve over the coming decade and what these anticipated changes might mean for Australia's defense. The red team exercise provided an analytic foil against which the teams, now playing the role of the ADF, could plan. The teams next turned to assessing how ADF force structure could be rebalanced over the next ten years to best counter and mitigate the expected PLA threat.

### ADF Strategy: Homeland Defense, Strengthen Alliances, and Support Economic Growth

All six teams agreed that Australia's foremost priority is homeland defense, and most teams believed this required forward defense beyond Australia's borders. There was consensus that the nation's defense perimeter formed an arc that stretched from the eastern Indian Ocean through maritime Southeast Asia to the South Pacific—essentially the island continent's western, northern, and eastern flanks. Some teams referred to this geographic zone as the “inner arc” or Australia's “primary area of military interest.”<sup>13</sup>

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13 Australia's inner arc is commonly characterized as the area from the Indonesian archipelago, Timor-Leste, and Papua New Guinea in the north to the Solomon Islands, Vanuatu, Fiji, New Caledonia, and New Zealand in the east. See Paul Dibb, “The Importance of the Inner Arc to Australian Defence Policy and Planning,” *Security Challenges* 8, no.4, 2012, p. 13.

There was unanimity among the teams that the ADF needed to deny adversaries the ability to project power through the northern approaches to Australia. Based on this objective, all teams believed it was essential to preclude China from exerting economic, political, and military control over Southeast Asia and the area within the “inner arc.” Three teams identified domestic freedom from malign foreign influence as an element of homeland defense.

**FIGURE 7: AUSTRALIA'S NORTHERN APPROACHES**



**Source:** Created by CSBA using map data courtesy of [naturalearthdata.com](https://www.naturalearthdata.com) and Copernicus Sentinel-2.

The teams determined Australia must play an active role in upholding the rules-based international order and engaging countries in the inner arc. All teams concurred that Australia’s defense relationship with the United States was crucial and that the U.S. military was a vital force multiplier to the ADF’s capabilities. As a result, all teams prioritized an operationally integrated alliance with the United States. They preferred and looked to increased U.S. engagement in the region.

Nonetheless, three teams expressed some degree of unease about the staying power of the United States. They were concerned about America’s defense budget shortfalls, its commitments in other theaters that might distract from its obligations in Asia, and the possibility of U.S. abandonment, even if that were judged highly unlikely. These teams thus stated a need to minimize overreliance on the United States and to develop strong bilateral and multilateral relationships with other regional countries, including U.S. allies such as Japan.

All teams aimed to protect Australia’s access to SLOCs, due to their importance to the nation’s maritime trade and economic well-being. The teams articulated the need for



Australia to preserve some degree of independent agency. Five teams, for example, asserted Australia should have a defense industrial base that could build, maintain, and sustain a certain level of vital capabilities, particularly munitions.

### **ADF Missions: C4ISR, Air Defense, Long-Range Strike, and Military Diplomacy**

Given Australia's expansive geography and the vast adjacent maritime areas, five teams believed the ADF needed to invest in domain awareness capabilities, meaning the ability to sense the nation's surroundings. The teams procured ISR systems and theater information networks, especially directed toward Australia's northern front, to detect airborne, surface, and undersea threats. The groups viewed these ISR investments as integral to Australia's long-range maritime strike capabilities. Two teams stood out for their argument that investments in ISR and battle networks would reduce reliance on the U.S. military for sensing data.

Due to the growing range of Chinese systems and platforms, all teams identified Australia's lack of a long-range integrated air and missile defense (IAMD) system as a major gap that needed to be addressed soon. The teams were concerned about Australia's growing vulnerability to air and missile attacks, particularly in the north, which could be threatened by PLA IRBMs and land-attack cruise missiles.

Five teams agreed Australia must increase the ADF's ability to hold an adversary at risk farther from Australian shores and to deter an enemy from projecting power through Australia's northern approaches. To strengthen Australia's deterrent posture, especially in the maritime domain, most teams thought the ADF needed to undertake long-range maritime strike missions. Indeed, all six teams invested in some form of long-range strike capability.

Finally, five teams believed the ADF must focus on fostering regional relationships within Australia's inner arc. By working closely with partner nations and strengthening regional ties, the teams intended the ADF to become the preferred partner of choice for the inner arc states. Most teams believed building partner military capabilities and promoting regional military cooperation would help the ADF maintain regional stability and strengthen a local bulwark against Chinese influence.

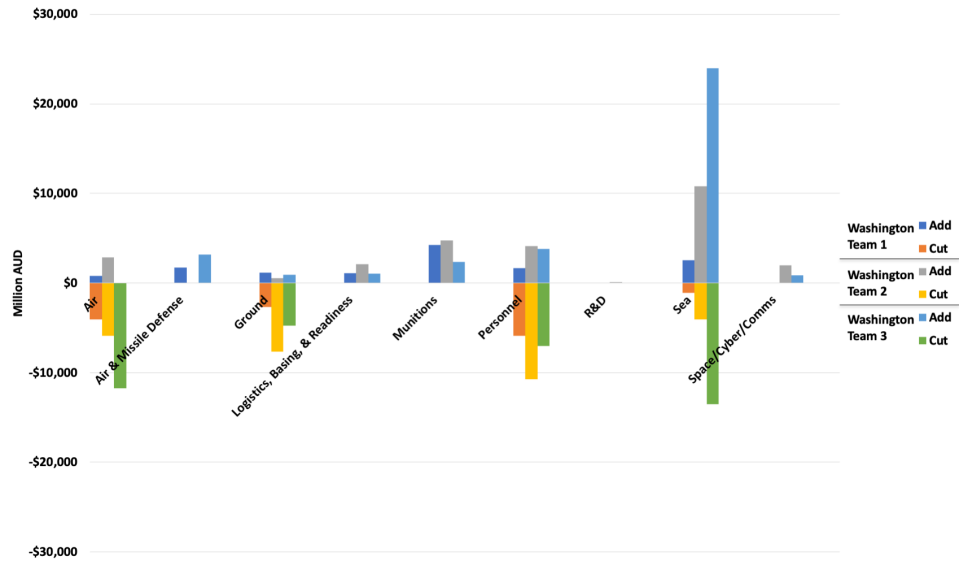
### **ADF Capabilities for a High-End Fight: Networks, Infrastructure, Air Defense, and Strike**

The teams' choices during the exercises reflected their intent on rebalancing the ADF to optimize for a deterrence-by-denial strategy against a great power threat. In the simplest terms, *deterrence by denial* refers to responses meant to prevent an opponent from achieving its objectives via the use of force. In essence, if Australia possessed credible means to preclude an adversary from obtaining its desired outcomes, then Canberra stood a better chance of deterring the enemy from acting in the first place. To achieve deterrence by denial, the teams



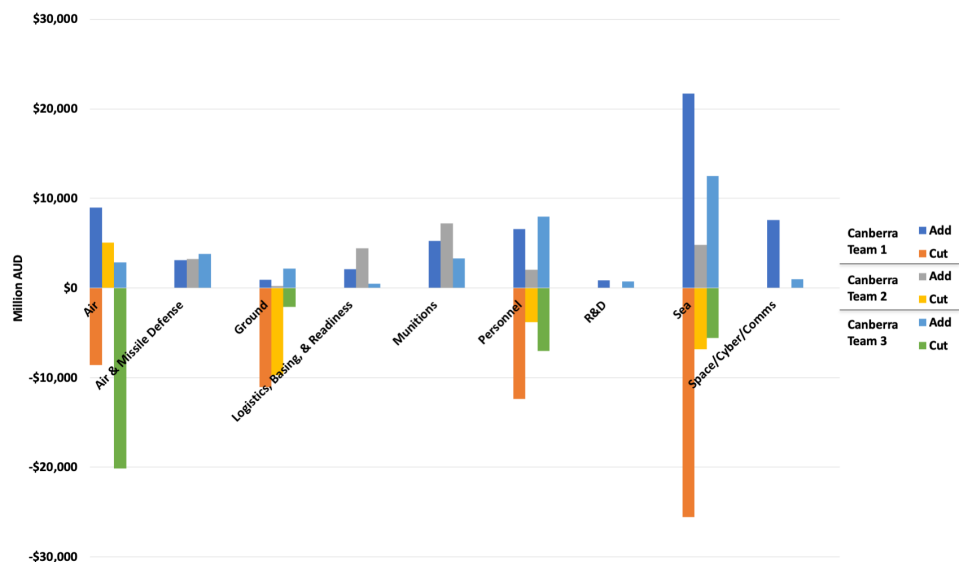
emphasized ADF network and C4ISR redundancy and resiliency as well as the ability to intercept air and missile threats. Most teams improved infrastructure in northern Australia to accommodate both the ADF and allied forces. They actively shaped their forces to be more deployable in the inner arc. All teams selected capabilities that would allow the ADF to conduct long-range strikes, though team choices of platforms and munitions varied widely.

**FIGURE 8: WASHINGTON TEAMS' ADF REBALANCING RESULTS**



Source: Created by CSBA.

**FIGURE 9: CANBERRA TEAMS' ADF REBALANCING RESULTS**



Source: Created by CSBA.

## Greater Domain Awareness and Battlefield Connectivity: C4ISR, Theater Battle Networks, and Autonomous Systems

Four teams invested in assets to enhance ISR resilience and domain awareness. The teams stressed that the ADF needed to better connect its platforms and deepen connections between the services. At the same time, they called for capabilities that would disrupt adversary operations and enemy command and control networks. They prioritized funding for defensive cyber operations, satellite signal jammers, and rapid reaction microsattellites.

Two teams wanted to reduce dependency on U.S. ISR assets. They were concerned that U.S. satellite bandwidth during a major conflict would be limited, constraining Washington's ability and willingness to share data in a timely and meaningful manner. These teams chose to purchase military communication satellites, space-control capabilities, and satellite imagery capabilities. Three teams acquired battle management systems to increase battlespace awareness. These included investments in the Jindalee Operational Radar Network, increased funding for the Joint Advanced Battle Management System, and financing for battlefield command systems.

Finally, all six teams invested in autonomous maritime systems to improve surveillance. On average, five teams procured 60 extra-large and medium-sized UUVs, including Ghost Shark UUVs. Four teams acquired additional maritime surveillance Bluebottle unmanned surface vehicles, increasing Australia's inventory from five to ten vessels on average. Three teams procured additional LOSVs, raising the baseline by an average of two systems. Such vessels can be operated by crews or by remote control. The teams that procured the LOSVs believed doing so could increase the number of vertical launch system (VLS) cells—missile launching tubes built into the ship's hull—and sensors available to the surface fleet in a cost-effective fashion, especially compared with more expensive surface combatants, such as the *Hunter*-class frigate.

### A Hardened North: ADF and Allied Infrastructure

All teams recognized that Australia's northern bases and infrastructure are essential for ADF's operations and as a forward base for Australian and allied regional engagement. All teams invested in logistics and basing options to advance the current and future posture of U.S. and allied forces. Three teams increased funding for U.S. Force Posture Initiatives, an existing defense relationship with the United States that helps fund U.S. rotational force presence and infrastructure to support U.S. deployed forces in the region. Three teams invested in additional coalition exercises between the ADF and the United States to increase interoperability. To sustain U.S. and allied forces in case of conflict, especially a protracted one, the teams invested in a variety of logistics and maintenance infrastructure, particularly repair and fuel storage facilities.

Given the PLA's growing long-range strike capabilities, the teams hardened Australia's infrastructure and increased the resilience of its bases. The teams invested in hardened

communication nodes, protected fuel reserves, and naval base upgrades. Two teams in the Canberra exercise increased Australia's overseas basing and access with a focus on countries that did not already have a strong U.S. military presence to minimize duplication of effort. These teams believed an increased ADF overseas presence would help defend the northern approaches, enhance long-range air and maritime domain awareness, and protect Australia's borders and offshore maritime interests.

### **Constructing a Shield: Air Defense Batteries and Munitions**

Growing Chinese air and missile threats led five teams to invest in air defense batteries. The teams commonly procured the U.S.-built Patriot medium-range surface-to-air missile systems, buying an average of three batteries. Four teams purchased an average of 160 SM-6 missiles to defend against short- to medium-range ballistic missiles. Three teams purchased Terminal High-Altitude Area Defense (THAAD) batteries for a road-mobile ballistic missile defense capability. The teams looked at, but declined to pursue, the AEGIS Ashore option. To defend against the PLARF's increasingly sophisticated projectiles, three teams funded a hypersonic and ballistic tracking space sensor to detect and track enemy hypersonic missiles.

### **Acquiring Long-Range Strike: Munitions, Submarines, Bombers, and IRBMs**

The teams acquired offensive capabilities to enable strikes against targets at long ranges, hold an opponent's assets at risk, and complicate adversary planning and operations. Individual team decisions varied widely across a wide range of capabilities, including long-range munitions, SSNs, strategic bombers, and IRBMs.

All teams invested in long-range strike munitions. Three teams purchased an average of 40 Long-Range Anti-Ship Missiles (LRASMs). Three teams bought air-launched hypersonic missiles, either by procuring the Hypersonic Attack Cruise Missile (HACM) or by funding U.S.-Australia codevelopment of a next-generation weapon. One team codeveloped a next-generation hypersonic weapon with the United States, purchased 20 HACMs, and plowed money into research and development programs on hypersonics. There was no consensus, however, about investments in other types of long-range strike munitions. At least one team selected the land-attack version of the Precision Strike Missile (PrSM) that included investments in indigenous production, the Joint Air-to-Surface Missile-Extended Range (JASSM-ER), the Tomahawk Land-Attack Missile (TLAM), and the Tomahawk Anti-Ship Missile (TASM).

The most contentious topic in both exercises was Australia's multibillion-dollar conventionally armed, nuclear-powered submarine program. Only two teams chose to keep the SSN-AUKUS program. The other four teams either bought an additional *Virginia*-class submarine in the near term or preordered *Virginia*-class submarines for delivery in the late 2030s. Those four teams collectively offered a series of reasons for canceling the program:

- The participants were confident in the *Virginia*-class's proven design, its production line, and its operational capabilities.
- They expressed deep ambivalence about the strength of the UK's submarine industrial base and its ability to complete the SSN-AUKUS project on time and on budget.
- They were daunted by the complexities of a multinational project involving UK and Australian coproduction and the transfer of U.S. nuclear submarine technology, which seemed to promise delays.
- The participants further voiced dissatisfaction with the SSN-AUKUS production schedule, under which Australia would not receive its first boat until the early 2040s.
- One team doubted the RAN's ability to simultaneously operate and sustain three unique submarine classes, the *Collins*, *Virginia*, and SSN-AUKUS.

The teams that kept the SSN-AUKUS program tended to believe the multinational defense industrial base challenges were surmountable. They were more inclined to give weight to the benefits of an indigenous nuclear-powered submarine industrial base. Regardless of each team's decision to maintain or cancel the SSN-AUKUS program, the choice was hotly debated among each team's members. Several teams were unable to reach unanimous agreement on either decision. Nevertheless, all teams agreed Australia should procure nuclear-powered submarines.

**FIGURE 10: AUSTRALIA SUBMARINE INVESTMENTS/DIVESTMENTS**

Teams	Cancel AUKUS	Purchase Virginias	Purchase Attack Submarines	Pre-Order Block VII Virginias
Washington Team 1	-	-	-	-
Washington Team 2	-	-	-	-
Washington Team 3	Yes	+1	+3	Yes
Canberra Team 1	Yes	+1	-	Yes
Canberra Team 2	Yes	-	-	Yes
Canberra Team 3	Yes	+1	-	Yes

\*\*\*All Canberra teams canceled AUKUS

Source: Created by CSBA.

Beyond munitions and submarines, the teams considered other long-range strike capabilities, including strategic bombers. All teams indicated support for continued rotations of U.S. bombers at Australian bases. Two teams invested in airfield improvements to enable B-21 bomber rotations. One of those teams intended to purchase B-21s for the Royal Australian Air Force (RAAF) during the 2035–2039 timeframe to hedge against delays in the SSN-AUKUS submarine program. That same team dedicated more funding to support U.S. B-21 bomber rotations through Australia. A third team stated that, with an increased

Australian defense budget, its investment in the second half of the 2030s would have been in B-21 airfield improvements and ADF cocrewing of U.S. B-21s.

Two teams decided to codevelop an IRBM system with the United States.<sup>14</sup> They believed the Australian continent's enormous size provided an ideal location for these mobile platforms. Truck-mounted IRBM units would be able to "shoot and scoot," enhancing their survivability while compelling enemy forces to dedicate scarce sensing assets to find and track them. They further expressed confidence that such land-based theater-range missile systems would provide a prompt, long-range strike option that would greatly complicate PLA operations against Australia. Finally, one team modified an existing C-130 transport aircraft into an arsenal plane that could launch palletized stand-off munitions against adversary air defenses in uncontested airspace. This option would allow the ADF to increase firepower by relying on existing platforms.

### Bill Payers and Key Uncertainties

All teams concurred that the ADF is a small, lean force, with minimal excess weight that can be shed to free up funds for new programs. As one participant remarked, the entirety of ADF personnel could comfortably fit into a large sports stadium. All teams thus struggled to extract savings to fund their priority missions and capabilities. Put another way, the opportunity costs proved quite high when the teams attempted to rebalance the force in a significant way.

In the sea domain, four teams canceled the SSN-AUKUS submarine program, producing some of the largest savings during the exercises. Although some of these funds were reinvested in procuring *Virginia*-class SSNs, the decision to cancel investment in the UK submarine industrial base and forego a domestic nuclear submarine industrial base generated net savings. Four teams retired an average of five *Arafura*-class Offshore Patrol Vessels. The teams generally believed the missions performed by these vessels were not within the purview of the ADF and would be better supported by the Australian Border Force.

Most teams reluctantly cut army units, commonly reducing artillery units and scaling back main battle tank procurement. Given the teams' strategic focus on countering long-range air and maritime threats, they believed artillery and armor would be less relevant for future ADF missions. Four teams retired all self-propelled artillery batteries, three teams cut at least half of the M777 artillery batteries, and three teams reduced planned M1A2 Abram tank procurement by an average of 65 tanks. Although the teams made additional ground cuts, there was no consensus on where the ADF should concentrate its reductions. The teams varied in their decisions on whether to cut units or simply reduce procurement. For instance,

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14 For additional detail on the potential codevelopment of an IRBM between Australia, the United States, and the United Kingdom, see Eric Edelman, Chris Bassler, Toshi Yoshihara, and Tyler Hacker, *Rings of Fire: A Conventional Missile Strategy for a Post-INF Treaty World* (Washington, DC: Center for Strategic and Budgetary Assessments, 2022), pp. 63–64.

two teams reduced armored cavalry regiments, two teams retired reserve artillery units, and two teams reduced AS21 Redback procurement, among other divestments.

In the air domain, four teams reduced fixed-wing fighter aircraft. Among those teams, three reduced F-35 procurement by an average of ten aircraft and two retired an average of 18 F/A-18 Fs. These cuts were partly driven by the teams' need to generate cost savings. More importantly, these reductions revealed an implicit belief among some teams that short-range fighter aircraft will have limited utility in likely conflict scenarios.

Aside from the sea, ground, and air cuts, there were no discernible patterns in how the teams divested their forces. The teams' choices varied on a case-by-case basis. Although some observers occasionally pointed to the two *Canberra*-class amphibious assault ships as a potential source of savings, no team retired both ships and only one team decommissioned a vessel. The teams uniformly evinced a belief that this capability was vital for ensuring Australian influence across Southeast Asian and Pacific Island nations. Many saw Australia's ability to provide humanitarian assistance and disaster relief and to conduct stability operations along the inner arc as a core component of national defense. Although the teams acknowledged the *Canberra*-class ships would not survive in a high-intensity conflict against the PLA, they believed these vessels remained vital to maintaining a stable and peaceful Indo-Pacific, a key objective for all teams.

**FIGURE 11: CUTS TO ADF GROUND FORCES**

Force Structure	Washington Team 1	Washington Team 2	Washington Team 3	Canberra Team 1	Canberra Team 2	Canberra Team 3
Infantry Battalion	-	-	-	+1	-	-
Mechanized Infantry Battalion	-	-	-	-1	-	-
Amphibious Infantry Battalion	-	+1	+2	-	-	-
Armored Cavalry Regiment	-	-	-1	-	-2	-
Security Assistance Battalion	-	-	-	-	-	+1
Reserve Artillery Regiment	-	-1	-	-	-	-1
Artillery Regiment	-	-2	-	-	-	-1
Self-Propelled Artillery Regiment	-	-1	-1	-1	-	-1
IRBM Battery*	+2	-	+1	-	-	-
GLCM Battery*	-	-	-	-	-	+5
HIMARS Battery	-7	+2	-	-	-	-
AS9 Huntsman Self-Propelled Howitzer Fires Battery	-	-3	-	-3	-	-
M777 Howitzer Fires Battery	-	-6	-	-6	-	-
Anti-Ship Missile Battery*	-	-	-	-	-	+2
AS21 Redback IFVs	-25	-	-	-50	-	-
M1A2 Abrams Tanks	-	-60	-	-70	-70	-
Hawkei PMV-Ls	-	-	-	-	-550	-

**Note:** \* denotes systems not currently in the ADF program-of-record.

**Source:** Created by CSBA.

### **Team Self-Assessments of Their Choices**

Across both exercises, the teams expressed confidence that they had built a force that could better implement Australia's deterrence-by-denial strategy. They believed they had equipped the ADF with defensive and offensive capabilities for deterring the PRC and, if necessary, intercepting approaching PLA forces in wartime. The teams addressed what they saw as a gap in Australia's air and missile defense network.

The teams built a stronger defensive posture in northern Australia, hardening infrastructure and fuel storage while increasing military construction. Investments in logistics and basing positioned Australia to sustain U.S. operations. Beyond infrastructure, the teams tried to help increase U.S. force presence in the region and create opportunities for more military exercises with U.S. forces.

The teams generally believed the ADF was in a better position to contribute to a high-end conflict in the theater. They increased Australia's long-range strike capability across the kill chain by connecting precision-strike munitions to space-, sea-, and air-based sensors. Finally, the teams increased Australia's ability to produce and sustain vital capabilities, particularly munitions, strengthening its sovereign defense industrial capacity.

### **An Analytic Caveat**

It is worth repeating that the exercises were not meant to be predictive. They do not foretell the trajectories of the PLA and the ADF over the next decade, nor were the exercises meant to be verdicts on Beijing's and Canberra's real-world decisions about their respective militaries. The team members were seasoned professionals, former and active practitioners, or accomplished scholars well versed in strategic affairs; all of them were intimately familiar with the national security ecosystems in Washington and Canberra. Many were former or active alliance managers who understood the complex dynamics in the trans-Pacific relationship. The consensus views and the disagreements summarized above should be treated as deeply informed judgments by experts with diverse backgrounds about the future directions of the PLA and ADF. They should serve as a jumping-off point for further analysis and debate. The next chapter will use the rich materials from the exercises to discuss key uncertainties and the attendant risks surrounding PLA and ADF modernization.





## CHAPTER 3

# Assessing the Team Decisions

The breadth and depth of the discussions throughout the exercises in Washington and Canberra generated policy-relevant insights and valuable ideas. Indeed, the amount and kinds of proposals and observations made at the two events were too numerous to permit an exhaustive survey in this study. This chapter captures the key analytic themes from the two workshops that the CSBA team judged strategically and operationally consequential. It then identifies the assumptions, trendlines, risks, and uncertainties associated with these themes that deserve further interrogation. To inform future research and analysis, this chapter asks a series of questions about those risks and uncertainties.

### **The PRC's Sense of Timing: Urgent or Not?**

Beginning with the rebalancing exercises for the PLA, one commonality is that all six teams held somewhat sanguine views of the PRC's likely military actions over the next decade. No team intended to conduct a major offensive campaign within the next decade. The teams declined to provide a timeline for when China should achieve or approach achieving its regional and global aims. For example, none directed the PLA to be prepared to invade Taiwan by the end of the decade or in the early 2030s. Instead, the teams preferred to build the PLA as a deterrent force to discourage a Taiwanese declaration of independence. They saw hard power as a backstop to the various nonmilitary means to achieve PRC objectives. The team choices reflected an implicit assumption that Beijing views political, economic, and sociocultural tools as sufficient to achieve its goals. They also reflected the belief that China would act militarily only if it was compelled to use force during the remainder of the 2020s and the early 2030s.

These assumptions raise important questions about the degree of CCP agency and the regime's sense of timing about decisions to use force. Some analysts, for instance, believe the PRC may be compelled to act militarily against Taiwan sooner rather than later, owing to perceptions of a closing window of opportunity. This "peak China" hypothesis contends the many structural problems besetting Beijing—such as demographic decline

and corruption—could precipitate weakening much sooner than assumed. Chinese leaders might thus choose to act on issues requiring substantial national resources, like an invasion of Taiwan, before it is too late to do so.<sup>15</sup> The sense of urgency to act before the onset of a national downturn could mean a timetable for conquest sooner than most presume.

Other observers lend greater agency to Chinese strategy. According to this line of reasoning, military conquest of key nearby terrain, which would shatter U.S. coalitions in Asia, is the surest way for China to achieve regional hegemony. The best way to do so is to seize the target territory as quickly as possible, before third parties can effectively intervene, thereby presenting the United States, the region, and the world a *fait accompli*.<sup>16</sup> This would make any attempts to roll back that conquest too costly and make the new realities as irreversible as possible. The logic of this strategy suggests Beijing would not be reacting to events, such as a prospective decline in power. Rather, it would proactively seek to change the territorial status quo at a time and place of its own choosing. In this case, the idea that the CCP would put off an attack on Taiwan indefinitely, unless provoked by Taipei or Washington, seems less plausible.

Still others believe America's military decline might influence China's calculus about the use of force. Technological factors including rising per unit costs of weaponry, political decisions such as those that deferred funding for modernization, fiscal constraints owing to the growing share of nondiscretionary spending in the federal budget, and a confluence of external shocks like the 2007–2008 financial crisis led to a capacity trough that is expected to run through the 2020s.<sup>17</sup> Described variously as the “terrible 20s” or the “decade of concern,” the U.S. military may bottom out during this period as the services field forces older and smaller than they have been in decades. Beijing might be tempted to act during the nadir, however temporary, of American military power.

There may be more personalistic dynamics at work. Given Xi's consolidation of domestic political power, his personal ambitions or fears could have an outsized influence on the CCP's calculations. For instance, Xi's China Dream, which encompasses his territorial ambitions, might spur him to take expedited action. He may see force as a way to cement his legacy before he succumbs to old age. Furthermore, external or internal shocks could force the PRC's hand. For example, internal chaos in North Korea could quickly pull in the PLA. These factors, individually or in combinations, suggest deterrence may be more fragile than many presume. Moreover, the pressures and temptations for the CCP to act over the coming decade may be greater than assumed.

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15 See Hal Brands and Michael Beckley, *Danger Zone: The Coming Conflict with China* (New York: W.W. Norton, 2022).

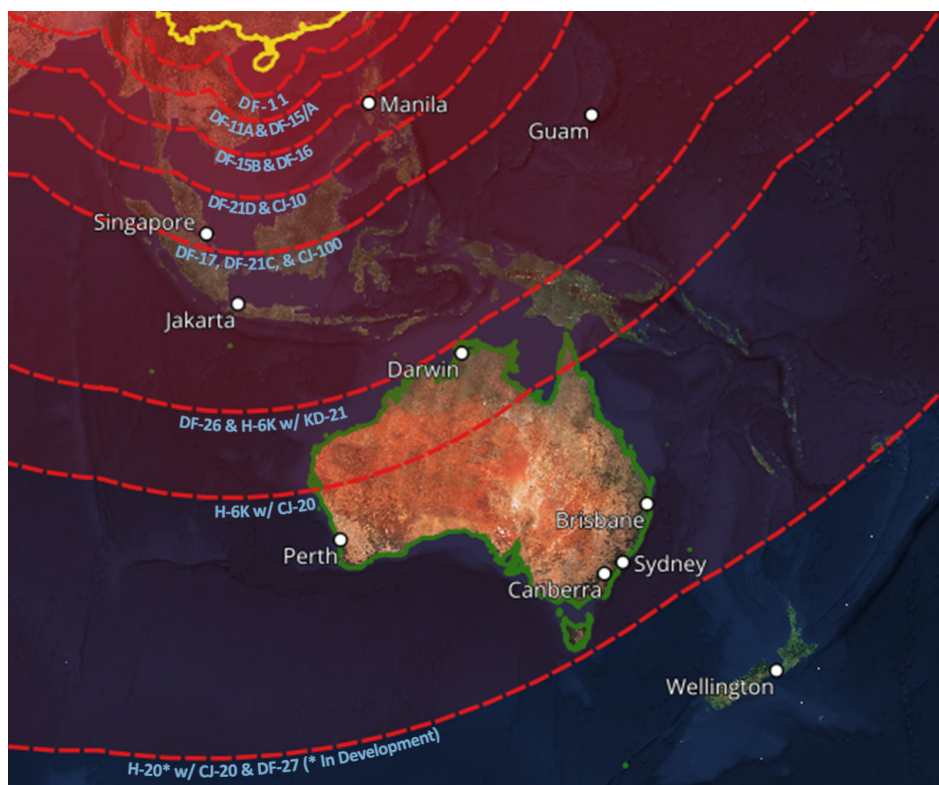
16 See Elbridge A. Colby, *The Strategy of Denial: American Defense in an Age of Great Power Conflict* (New Haven, CT: Yale University Press, 2021).

17 See Mackenzie Eaglen and Hallie Coyne, *The 2020s Tri-Service Modernization Crunch* (Washington, DC: American Enterprise Institute, 2021).

## The PLA's Reach: Eroding Australia's Sanctuary Status?

Across the exercises, the teams tended to depict the PLA's direct threat to Australia as relatively constrained. The teams saw the PLA as hemmed in by the First Island Chain, with PLA threats running on a north–south axis from China toward Australia. The Australia teams accordingly focused on defending the island continent's northern approaches to protect the homeland. This judgment reflected assumptions about Australia's geographic location and the stopping power of water and distance. One enduring factor that likely informed this view is that a power projection force typically loses potency as it moves farther away from its home country. This is certainly a powerful and appealing idea given that Australia has historically sat at the limit of the power projection ranges of its most powerful adversaries.

FIGURE 12: THE PLA'S INCREASING REACH



**Note:** Ranges are estimated. Systems grouped together have similar, albeit slightly different ranges.

**Source:** Created by CSBA using map data courtesy of [naturalearthdata.com](https://www.naturalearthdata.com) and Copernicus Sentinel-2. Ranges for CJ-100, DF-11A, DF-15B, DF-16, DF-17, and DF-26 sourced from HIS Janes database. DF-21C range sourced from CSIS, "DF-21," *Missile Threat*, April 23, 2024, <https://missile-threat.csis.org/missile/df-21/>. Range for CJ-20 sourced from U.S. Army Training and Doctrine Command (TRADOC), "Changjian-20 (CJ-20)," *OE Data Integration Network (ODIN)*, [https://odin.tradoc.army.mil/WEG/Asset/Changjian-20\\_\(CJ-20\)\\_Chinese\\_Air-launched/Land-Attack\\_Cruise\\_Missile](https://odin.tradoc.army.mil/WEG/Asset/Changjian-20_(CJ-20)_Chinese_Air-launched/Land-Attack_Cruise_Missile). Ranges for CJ-10, DF-21D, and DF-27 sourced from OSD, *Military and Security Developments Involving the People's Republic of China*, 2023, p. 67–69. KD-21 range sourced from Thomas Nedwick, "China's H-6K Bomber Seen Firing Air-Launched Ballistic Missile For First Time," *The War Zone*, May 1, 2024, <https://www.twz.com/air/chinas-h-6k-bomber-seen-firing-air-launched-ballistic-missile-for-first-time>. H-6K combat radius sourced from Rick Joe, "How the Descendants of a 1950s Bomber Transformed China's Strike Reach," *The Diplomat*, November 18, 2020, <https://thediplomat.com/2020/11/how-the-descendants-of-a-1950s-bomber-transformed-chinas-strike-reach/>. The H-20 is estimated to have similar specifications to the B-2A, so the H-20 combat radius is estimated as half the range of a B-2A at max take-off weight. Janes, "China's H-20 Stealth Bomber Close to First Flight," July 13, 2022, <https://www.janes.com/osint-insights/defence-news/defence/chinas-h-20-stealth-bomber-close-to-first-flight>.

In recent decades, the proliferation of long-range precision strike technologies has significantly shrunk the battlespace, enabling militaries to threaten previously unreachable targets. As a result, territories once considered sanctuaries because they were too far from the effective ranges of enemy firepower are no longer safe from attack. The PLA has poured enormous resources into expanding its ability to hold distant targets at risk. The DF-26 IRBM, which can strike Guam, has pushed the PLA's threat envelope forward over large swathes of the Western Pacific. The DF-26 is among the fastest growing class of missiles in the PLARF's arsenal. As a result, U.S. forces can no longer assume they can operate safely out of Guam. As noted in Chapter 2, many teams doubled down on the DF-26 during the rebalancing exercises for the PLA.

Parts of Australia are also beginning to come within range of some PLA forces, albeit in much smaller numbers than those that can strike Taiwan, Japan, or the Philippines. H-6 bombers armed with land-attack missiles and DF-26 missiles, if they were deployed on the Spratly Island bases in the South China Sea, could target northern Australia. The PLAN's surface combatants and submarines armed with land-attack missiles could transit through the First Island Chain to threaten Australia's coastlines. They can be employed to interdict shipping along critical SLOCs that connect Australia to the rest of the world. The PLA's advances in cyber forces have also enabled it to reach directly into Australia, complicating homeland defense.

The PLA is rapidly expanding its air and naval power projection capabilities, a trend that the teams in both exercises expected to continue. Its forthcoming long-range capabilities, including the stealthy H-20 strategic bomber, nuclear-powered guided-missile submarines, and the DF-27 IRBM/ICBM, will offer new means of delivering firepower against Australia. The Pentagon's annual report on Chinese military power acknowledges the PRC may be looking into conventionally armed intercontinental ballistic missiles (ICBMs).<sup>18</sup> Other capabilities could be developed to amplify these long-range threats. For instance, several teams procured nuclear-powered guided-missile submarines armed with hypersonic missiles. Although such a capability is notional now, the choice made during the exercises shows the participants saw combinations of cutting-edge tools as highly efficacious for PLA power projection.

The growing reach and lethality of the PLA suggests two areas for further investigation. First, under what circumstances might Beijing seek to employ its long-range strike systems against Australia? In a contingency over Taiwan, Australia would be a secondary and distant theater of operations. It would therefore be useful to evaluate the conditions under which the PLA would feel compelled to expend expensive, exquisite weaponry and use scarce, in-demand sensing resources against Australia. For example, what might a suppression

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18 OSD, *Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2023), p. 66, [media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-military-and-security-developments-involving-the-peoples-republic-of-china.pdf](https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-military-and-security-developments-involving-the-peoples-republic-of-china.pdf).

campaign look like? What are the requirements and opportunity costs? Second, what types and quantities of weaponry would the PLA need to acquire to meaningfully erode Australia's sanctuary status? What might an extended A2/AD architecture look like? Are there any useful benchmarks or metrics for evaluating this architecture? At what point would the threat to Australia approach the PLA's threat to Guam today?

## PLA Power Projection: Going Global or Staying Local?

Reflecting their regional focus, the teams were generally less inclined to invest in power projection. Indeed, four teams were willing to forego elements of their carrier fleets—the foundation of a global seagoing force backed by naval aviation—in favor of weapons they deemed more important. One team retired the Type 001 *Liaoning* carrier, which was commissioned in 2012, at least a decade before the end of its expected service life. Another team decommissioned the *Liaoning* carrier and reduced the planned buys of three Type 052D destroyers and four Type 054B frigates, the go-to modern naval escorts for the PLAN's carrier strike group formations.

Two other teams rolled back the Chinese navy's carrier ambitions even further. One retired the *Liaoning* as well as the first homebuilt Type 002 *Shandong* carrier, which was commissioned in late 2019 and would have been in service for just over a decade. One team delayed the development of the Type 004, the PLAN's first nuclear-powered supercarrier currently under construction, and cut back on the planned purchase of the Type 076, the next-generation amphibious assault ship that is expected to be the largest of its kind. The latter move was perhaps the clearest sign of disinterest in a globally oriented blue-water navy.

Only two teams chose to leave their carrier fleets untouched. One of them demonstrated a greater willingness to invest in expeditionary capabilities by acquiring three fleet replenishment oilers, three amphibious transport docks (LPDs), and three frigates on top of the planned buys. The other bought one fast combat support ship and two general stores issue ships, which are primarily used to resupply island garrisons in the South China Sea. These were nevertheless relatively modest moves to globalize the PLAN. Setting aside the exercises' built-in pressure to find bill payers to fund modernization priorities, the teams collectively demonstrated a preference for local over global missions.

These decisions appear to overrule the prevailing Chinese policy, strategy, doctrine, and force structure. Xi sees naval modernization as a core element of his ambitions to field a “world-class military,” one that would rival the most advanced Western militaries, including the United States.<sup>19</sup> Moreover, the PLAN has set its sights on becoming a global force that will be able to perform a wide range of missions across distant maritime theaters. Its new

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19 徐隽 金正波 [Xu Jun and Jin Zhengbo], “努力把人民海军全面建成世界一流海军—写在中国人民解放军海军成立75周年之际 [Strive to Build the People's Navy into a World-Class Navy—Written on the Occasion of the 75<sup>th</sup> Anniversary of the Founding of the Chinese People's Liberation Army Navy],” 人民日报 [People's Daily], April 22, 2024, <http://politics.people.com.cn/n1/2024/0422/c1001-40220335.html>.

strategic concept, for instance, embraces power projection into waters beyond the First Island Chain, forward presence on the world's oceans, and operations in the polar regions.<sup>20</sup> Its surface fleet, including large power projection platforms, is expected to be at the center of this global orientation.

PLA doctrine reaffirms this forward-leaning outlook. The authoritative *Science of Military Strategy*, published by the Chinese National Defense University, for example, exhorted the PLAN to develop “an effective deterrence and strike capability against powerful naval forces in the ocean far away from the country.” The reference to “powerful naval forces” almost certainly included the U.S. Navy. “Therefore, the development of aircraft carriers, large destroyers, strategic nuclear submarines, large ocean-going supply ships, long-range carrier-based aircraft, etc.,” the document went on to assert, “will become an important trend in the construction of naval equipment.”<sup>21</sup> In short, the Chinese navy is not going to shy away from a symmetrical buildup of forces.

The PLAN's force structure conforms to this seaward turn. Consider the growth in fleet size over ten years. In 2012, the PLAN had one carrier, 23 destroyers, 52 frigates, and 29 LPDs and landing ship tanks (LSTs). In 2022, it fielded two carriers, eight cruisers, 42 destroyers, 47 frigates, 50 corvettes, three landing helicopter assault ships (LHAs), and 57 LPDs and LSTs.<sup>22</sup> There had been no cruisers, corvettes, or LHAs in 2012. This growth has contributed to a more balanced fleet. According to a U.S. Navy projection, the PLAN is expected to have five carriers, 60 cruisers and destroyers, 135 frigates and corvettes, four LHAs, 14 LPDs, and 24 LSTs by 2030.<sup>23</sup>

The exercise teams' departure from the PLA's stated goals and force development raises a few questions. Under what circumstances might the PLA begin to globalize more decisively than in the recent past? For example, is there a level of sufficiency the PLA must reach for nearby contingencies, like a cross-strait war, to give Chinese leaders enough confidence to double down on going global? Is a globalized PLA more or less threatening to Australia than the A2/AD capabilities and other long-range strike systems the teams had the PRC invest in? How might the PLA employ its global forces against Australia? Could the PLA generate enough mass to outflank Australia to the west and the east while also being in position to pin down the ADF along the northern approaches?

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20 See Ryan D. Martinson, “The Role of the Arctic in Chinese Naval Strategy,” *China Brief* 19, no. 22, December 20, 2019, <https://jamestown.org/program/the-role-of-the-arctic-in-chinese-naval-strategy/>.

21 肖天亮 主编 [Xiao Tianliang, ed.], 战略学 [Science of Military Strategy] (Beijing: National Defense University, 2020), p. 361.

22 Ron O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities* (Washington, DC: Congressional Research Service (CRS), August 2024), p. 9.

23 *Ibid.*, p. 12.



## Allied Undersea Superiority: Will It Depreciate?

As noted in Chapter 2, five of the six teams identified ASW as a primary mission and rebalanced their forces accordingly. Indeed, the investments by some teams, covering as they did the entire kill chain, were quite aggressive. These decisions corresponded with real-world PLA procurement patterns that appear to confirm Beijing's intent to contest U.S. and allied superiority in undersea warfare. Historically, the Chinese military has lagged badly in ASW, owing to structural weaknesses, and it had until recently largely ceded this area of the competition to the United States. However, the PLA has begun to acquire a range of ASW capabilities, including air, surface, and subsurface platforms and undersea sensors, to address this vulnerability.<sup>24</sup> This shift is an important break from past patterns of behavior that has implications for allied undersea operations.

The PLAN's surface combatants are now equipped with modern variable-depth sonars and towed-array sonars for detecting submarines. The PLAN has acquired over 20 KQ-200 ASW aircraft, which first entered service in 2017.<sup>25</sup> The PLA has also been building its undersea sensor network along its near seas.<sup>26</sup> As Bryan Clark and Timothy Walton observed, the PLA is creating a more effective ASW architecture by combining "a multidimensional surveillance network undersea," a fleet of warships and civilian vessels, new sensors, uncrewed systems, and airborne assets. They concluded that "PRC active and passive sonar arrays and shore-based, shipboard, and airborne weapons launchers" would pose a threat to U.S. undersea forces in ways that resemble how the PLA's dense thicket of air defense systems on the mainland coast endangers nearby U.S. air operations.<sup>27</sup>

Although the U.S. will likely maintain its lead, China's methodical efforts will likely enable the PLA to gradually close the ASW gap through the remainder of the 2020s and into the 2030s and the 2040s. Even if the PRC were unable to reach parity with U.S. undersea capabilities in the coming decades, it would be prudent to assume the operational environment inside and near the First Island Chain will be more hazardous to American and allied submarines than in the past. With another two decades of effort, China may be able to further tilt the undersea balance. The bottom line is that the United States should not take its undersea capabilities, one of the crown jewels in its arsenal, for granted. The exercise teams implicitly acknowledged this reality by continuing their funding in Chinese ASW.

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24 Alastair Gale, "The Era of Total U.S. Submarine Dominance over China Is Ending," *The Wall Street Journal*, November 20, 2023, <https://www.wsj.com/world/china/us-submarine-dominance-shift-china-8db10a0d>.

25 Eli Tirk and Daniel Salisbury, "China Maritime Report No. 38: PLAN Anti-Submarine Warfare Aircraft—Sensors, Weapons, and Operational Concepts," China Maritime Studies Institute, May 7, 2024, p. 10, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1038&context=cmsi-maritime-reports>; Rick Joe, "The Chinese Navy's Growing Anti-Submarine Warfare Capabilities," *The Diplomat*, September 12, 2018, <https://thediplomat.com/2018/09/the-chinese-surface-fleets-growing-anti-submarine-warfare-capabilities/>.

26 Gale, "The Era of Total U.S. Submarine Dominance over China Is Ending."

27 Bryan Clark and Timothy A. Walton, *Fighting into the Bastions: Getting Noisier to Sustain the U.S. Undersea Advantage* (Washington, DC: Hudson Institute, 2023), p. 21.

These expected trendlines invite a few questions for further exploration. How will the character of undersea warfare evolve as the PLA begins to go after one of America's enduring military advantages in the subsurface domain? How contested will the near seas become, especially in the 2030s and beyond? What new operational concepts and capabilities will be needed for the United States and its allies to stay ahead of the competition? Will there be a time when certain approaches to the Chinese mainland will simply be too contested for U.S. and allied undersea forces? What are the larger implications for U.S. and allied investments? What kinds of institutional and cultural changes would need to take place to account for this expected shift in the undersea balance?

### **PLA Nuclear Modernization: Brinkmanship on the Horizon?**

During the China SCEs, all six teams listed nuclear deterrence as a major strategic goal. Only two teams, however, pursued new nuclear weapons. Although several teams invested in dual-use delivery systems that can carry nuclear and conventional warheads, like the DF-17 and DF-26 missiles, participants tended to emphasize their utility for conventional warfighting. Most were comfortable with CSBA's default projections of the PLA's nuclear forces into the 2030s, although one team stood out by developing nuclear-capable cruise missiles.

Most participants were less sure about assessing the direction of PLA nuclear modernization than about strengthening China's A2/AD architecture. They generally believed China's nuclear modernization is meant to shore up the credibility of its retaliatory posture and to ensure mutual vulnerability between the PRC and the United States. The teams did not actively consider how the Chinese leadership might use its nuclear arsenal for coercion, brinkmanship, and limited warfighting and what that might mean for Australia and the alliance.

The pace of PLA nuclear modernization continues to exceed expectations. According to the Pentagon's annual report, China had more than 500 operational warheads in 2023 and was on pace to field more than 1,000 warheads by 2030, doubling in size within a decade.<sup>28</sup> The U.S. Department of Defense estimated the PLA will have 1,500 nuclear warheads by 2035.<sup>29</sup> In 2023, the PLARF had 350 ICBMs and 500 ICBM launchers. The PRC constructed new ICBM silo fields totaling about 300 silos to house DF-31 and DF-41 missiles. The PLA has a nascent nuclear triad. Its six Type 094 SSBNs have enabled the PRC to "conduct near-continuous at-sea deterrence patrols," and the H-6N bomber can carry the nuclear-capable ALBM.<sup>30</sup> The next-generation Type 096 SSBN and the H-20 stealth bomber are expected to bolster China's nuclear deterrent.

At the same time, the PLA now boasts a more diversified set of theater-range nuclear systems, including the DF-17 hypersonic MRBM, the DF-26 IRBM, and the H-6N bomber.

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<sup>28</sup> OSD, *Military and Security Developments*, 2023, p. viiii.

<sup>29</sup> *Ibid.*, p. 98.

<sup>30</sup> *Ibid.*, p. 108.



The DF-26 IRBM has a range that exceeds 3,000 kilometers and is equipped with an advanced guidance system that could allow China to conduct nuclear precision strikes for the first time.<sup>31</sup> According to the Pentagon, the PLARF fielded 500 IRBMs and 250 IRBM launchers and 1,000 MRBMs and 300 MRBM launchers in 2023. Because the IRBMs and MRBMs can carry out conventional land-attack, anti-ship, and nuclear missions, only a portion of the missile force is likely dedicated to the nuclear role, although how many might be nuclear armed is not estimated in publicly available sources. Nevertheless, the PRC enjoys more tools to hold various regional targets at risk.

Australia will fall within the range of new long-range nuclear-capable strike systems. The H-20 stealth bomber, widely expected to enter service, will probably be able to reach Australia on an unfueled round trip from airbases in China. The newly operational nuclear-capable DF-27, has the range to threaten Australia from the Chinese mainland.<sup>32</sup> Moreover, new types of sea- and air-launched nuclear-armed cruise missiles launched from aircraft, ships, and submarines, which one of the exercise teams procured, would create additional strike options for Chinese policymakers.

China's growing strategic and theater nuclear forces have spurred debates about what these trends mean for the United States and its allies. In particular, analysts have speculated about the potential role of theater-range, dual-capable delivery systems in a crisis or war in Asia.<sup>33</sup> One hypothesis is that China might leverage its larger and more diverse theater systems to engage in brinkmanship at the beginning of a crisis to keep the United States and its allies out of a dispute involving the PRC, such as in a cross-strait confrontation. The goals would be "to strain U.S. extended deterrence commitments and isolate potential targets of aggression like Taiwan."<sup>34</sup> Specifically, "the threat of low-yield nuclear strikes against U.S. allies, U.S. overseas territories, or U.S. forward-operating forces" might convince the U.S. and allied policymakers to back off or to hesitate long enough for the PLA to achieve its operational objectives against Taiwan.

The growing asymmetry in the PRC–U.S. theater nuclear balance raises another set of analytic questions. To what extent are China's theater nuclear capabilities, which could be employed to decouple allies from the United States, relevant to Australia and to U.S. extended deterrence commitments to Canberra? Is this a phenomenon more a concern for Northeast Asian allies like Japan than for Australia? If so, to what extent is extended deterrence divisible between subtheaters of the Indo-Pacific? What changes in PLA nuclear forces

31 Defense Intelligence Agency (DIA), *China Military Power: Modernizing a Force to Fight and Win* (Washington, DC: DIA, 2019), p. 91.

32 OSD, *Military and Security Developments*, 2024, p. 65.

33 Chris Andrews and Justin Anderson, *China's Theater, Dual-Capable Delivery Systems: Integrated Deterrence and Risk Reduction Approaches to Counter a Growing Threat* (Washington, D.C.: National Defense University, August 2024).

34 Evan Braden Montgomery and Toshi Yoshihara, "The Real Challenge of China's Nuclear Modernization," *The Washington Quarterly* 45, no. 4, December 16, 2022, pp. 45–60, <https://doi.org/10.1080/0163660X.2022.2148508>.

might alter Canberra's perceptions of the credibility of U.S. extended deterrence? How might these changes challenge longstanding assumptions about nuclear deterrence and the U.S. nuclear umbrella? How should policymakers address the expected shifts in the nuclear balance and their impact on deterrence in Asia?

## Estimating Australia's Deterrent Value

Turning to the rebalancing exercises for the ADF, all teams recognized Australia's strategic value during a long-term geopolitical competition with China. When playing the role of PLA defense planners during the China SCEs, exercise participants commented on several Australian political and diplomatic strengths. They noted Australia maintains strong relationships with various Southeast Asian and Pacific Island nations, which could limit PRC influence across—and PLA access to—those territories. Australia could also leverage its international relationships to add credibility to U.S.-led efforts. Several teams cited PRC attempts to punish Australia via economic means as evidence of Beijing's sensitivity to Australia's policies.

On the military front, the teams were more circumspect about Australia's power to influence the CCP's calculations. Some teams were uncertain about the degree to which Australia factors into PRC thinking. One team observed, "China sees Australia more as an irritant than a serious threat. Australia is relatively easy to take care of compared to other allies like Japan."

On the other hand, some teams believed Beijing needed to account for Australia's strategic depth and its potential to serve as a resilient, self-sustaining power base for itself and its allies. Several teams noted Australia was well positioned to exert control over critical maritime chokepoints, like those along the Indonesian archipelago, and might be able to outflank PLA forces via the Indian Ocean. Most teams cited Australia's potential ability to conduct long-range strikes against PLA assets using the forthcoming fleet of nuclear-powered submarines.

During the exercises, the teams focused on how the ADF could intercept incoming Chinese forces approaching Australia and preclude the PLA from achieving its objectives along those avenues of attack. The teams rebalanced their forces to ensure Australia could detect incoming attacks, intercept PLA platforms at the outer edge of the ADF's operational range, and thereby convince Chinese leaders that the PLA military effort was not worth the cost.

This line of thinking is consistent with Australia's deterrence-by-denial strategy and in line with the teams' rebalancing decisions for the ADF. This approach might be best described as an offensive-defense strategy. During the ADF SCEs, the teams generally declined to acquire means to counterattack PLA forces on the mainland. Most teams did not seek to acquire ADF capabilities, other than the nuclear-powered submarines, that could hold PLA forces at risk from great distances.

Several teams during the ADF SCEs were conflicted about whether they should lean more toward independent ADF warfighting capabilities in preparation for high-end conflict or whether they should emphasize efforts to enable U.S.-led combat operations. Many teams decided to offer more U.S. access to bases to expand the menu of American strike options against the PLA. In their thinking, U.S. forces could exploit Australia's expansive territory to create a dispersed, self-sustaining axis of attack in wartime. Australia's defense industrial base, according to this line of reasoning, could complement U.S. forces through peacetime technology sharing and codevelopment as well as wartime munitions production.

These decisions suggest the participants appraised Australia's deterrent value vis-à-vis the PRC in largely defensive and enabling terms. In other words, Canberra and the ADF would add the most value by contesting the approaches to Australia, particularly along the inner arc, and by providing greater access to U.S. forces. This division of labor would be akin to that of the U.S.-Japan alliance, in which Tokyo would serve as the shield by defending the seas and airspace around the Japanese archipelago while the home islands would serve as the spear, a launch platform for U.S. power projection forces.

These judgments about Australia's defensive and enabling roles raise a set of questions. Are there tipping points in the security environment, including the PLA's modernization, that might alter estimates of Australia's deterrent value? What circumstances might drive Australia to consider a more offensive posture, including longer range counterstrike capabilities meant to hold a larger array of PLA forces at risk? What new strike systems, besides the nuclear-powered submarines, would make the most sense? How should policymakers conceive of the scale of future U.S. access to Australia beyond what is already planned or under consideration? Is there a notional floor and ceiling to such access?

## Rebalancing a Lean Force

All teams during the Australia SCEs struggled to find savings in ADF's planned spending on research and development, procurement, operations and maintenance (O&M), and personnel over the next decade. The ADF lacks big-ticket defense items that could generate savings. Put differently, all teams quickly reached a floor beneath which they were unwilling or reluctant to go to rebalance their forces. Indeed, compared to other SCEs that CSBA has conducted over the years to assess the force development of U.S. allies and partners, the Australian SCEs appeared to offer the fewest acceptable divestments.

To illustrate this constraint, consider this hypothetical move: If the ADF wished to procure one additional *Virginia*-class submarine at current levels of funding, a decision to cancel all remaining 129 Redback IFVs would not free up enough resources to buy another vessel. Only drastic and potentially self-defeating cuts—such as canceling the Army's Littoral Maneuver Vessels or the 11 general-purpose frigates—would provide enough funding to cover the initial procurement cost of one more *Virginia*-class sub. Although none of the teams chose to acquire B-21s over the next decade, consider another hypothetical plan to pursue the

bomber option: To obtain a squadron of B-21s, Australia would have to forego more than nine of its top ten acquisition programs. Obviously, this would be untenable.

The teams' narrow set of rebalancing choices reflected real-world policy decisions and their likely impact on future defense planning. In 2024, to address the recommendations laid out in the DSR, the Albanese government announced new planned increases in Australia's defense budget over the coming decade. Under these plans, Defence's budget would grow about 6.74 percent per year in nominal terms over 2024–2034. Australia's defense budget would grow from 2.02 percent of GDP in 2024 to 2.3 percent of GDP by 2034.<sup>35</sup>

In addition to the budget increase, the Albanese government has freed up resources by reducing planned acquisition and upgrade programs over the coming years by more than \$34 billion.<sup>36</sup> Notable cuts included canceling the acquisition of two Joint Support Ships, reducing the planned buy of the Redback IFV by more than two thirds, and canceling the planned acquisition of another F-35 squadron.<sup>37</sup> These cuts were consistent with the guidance from the DSR and the NDS that ADF needed to shift from a “balanced force” to a “focused force.”

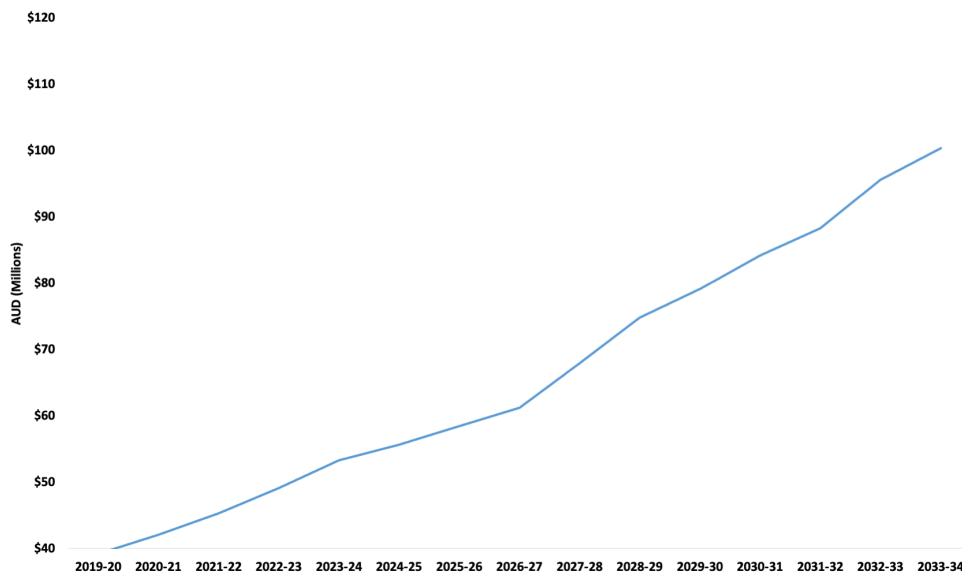
Such major cuts to these acquisition programs, along with several others, mean items that could be removed with acceptable risk were already being phased out. Any future cuts will likely be more painful and riskier, perhaps much more so, than those of the recent past. The exercise teams' laments and uneasy deliberations during the Australia SCEs accurately reflected these constraints. Short of an expansion in defense resources, future decisions to further rebalance the ADF toward a “focused force” must wrestle with this reality of scarcity.

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35 Arthur, “Australia Unveils Record \$37 Billion Defense Budget”; ADoD, “A Generational Investment in Australia's Defence,” May 14, 2024, <https://www.minister.defence.gov.au/media-releases/2024-05-14/generational-investment-australias-defence>.

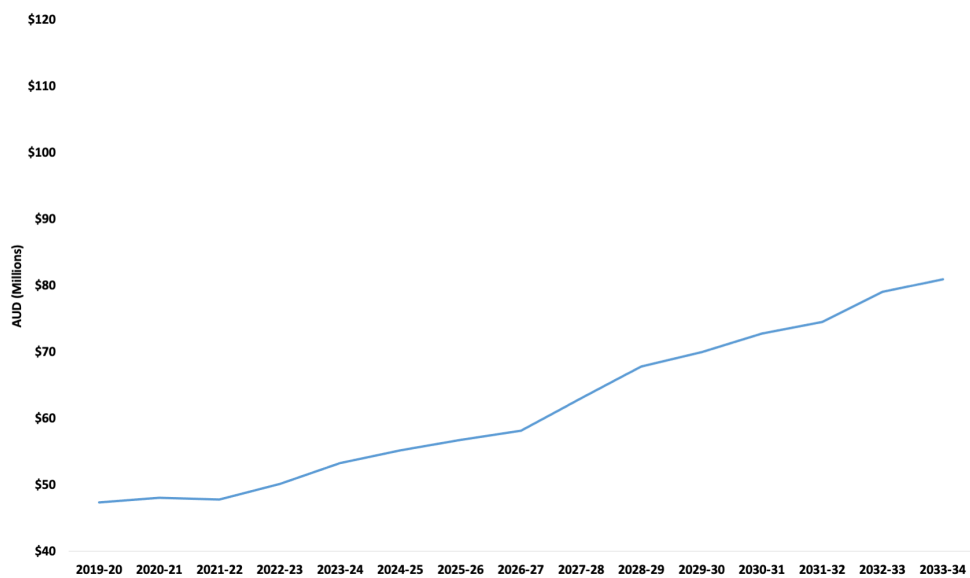
36 Colin Clark, “Australia Unveils ‘Historic’ Defense Boost to 2.4% of GDP in Decade, but Critics Say Too Little, Too Late,” *Breaking Defense*, April 17, 2024, <https://breakingdefense.com/2024/04/australia-unveils-historic-defense-boost-to-2-4-of-gdp-in-decade-critics-say-too-little-too-late/>.

37 Ibid.

**FIGURE 13: AUSTRALIA DEFENSE BUDGET TOPLINE FY20-FY34 (CURRENT AUD)**

**Source:** Created by CSBA. Data for 2019-20 to 2024-25 from ADoD, *2020-21 to 2024-25 Defence Portfolio Budget Statements* (Canberra, Australia: ADoD, 2020-2024), Table 4a. Future projections from ADoD, *National Defence Strategy* (Canberra, Australia: ADoD, 2024), p.67.

**Note:** In FY25 AUD inflated using HIS Janes defense budget inflators adjusted from FY24.

**FIGURE 14: AUSTRALIA DEFENSE BUDGET TOPLINE FY20-FY34 (CONSTANT AUD)**

**Source:** Created by CSBA. Data for 2019-20 to 2024-25 from ADoD, *2020-21 to 2024-25 Defence Portfolio Budget Statements* (Canberra, Australia: ADoD, 2020-2024), Table 4a. Future projections from ADoD, *National Defence Strategy* (Canberra, Australia: ADoD, 2024), p.67.

## Revisiting the AUKUS Decisions

The teams generated savings by restructuring the nuclear-powered submarine program, reducing ground forces, and cutting tactical fighters. The latter two options were somewhat straightforward because they involved existing capabilities. In contrast, the move to cancel the SSN-AUKUS submarine and procure additional *Virginia*-class submarines proved complex, requiring additional steps to manage the consequences of the reversal in procurement. The following discussion revisits the teams' decisions.

The landmark 2021 AUKUS agreement between Australia, the United Kingdom, and the United States created a pathway for Australia to acquire nuclear submarines, which evolved into a two-pronged effort with Pillar I focused on the sub program while Pillar II deals with emerging technologies. Pillar I involves three phases:

1. **U.S. and UK submarine presence in Australia:** Starting in 2027, up to four U.S. nuclear submarines and one UK nuclear submarine will rotate through HMAS Stirling in Western Australia in what will be called Submarine Rotational Force-West.
2. ***Virginia*-class submarines:** Australia will acquire at least three and up to five *Virginia*-class nuclear-powered submarines from the United States.
3. **SSN-AUKUS submarines:** Australia will procure three to five SSN-AUKUS submarines. The vessels will be UK-designed, incorporate some U.S. submarine technology, and be coproduced by the UK and Australia.<sup>38</sup>

The exercise teams were unanimous in their support for Australia's acquisition of conventionally armed nuclear-powered submarines. Four teams, however, including all three Canberra-based teams, decided to cancel the third phase, the SSN-AUKUS submarine program, though not without some contentious debates and agonizing. As noted in Chapter 2, the votes among team members to cancel the programs were not unanimous. Those who supported cutting the SSN-AUKUS program expressed strong doubts about its feasibility, long lead times, complexity, cost, and sustainment issues, as summarized in Chapter 2.

To remedy the shortfall from the cancelation, the teams extended Phase 2 by continuing procurement of *Virginia*-class submarines from the United States. They believed this alternative path would allow the RAN to replace the aging *Collins*-class conventional submarines sooner and at lower cost. Australia would generate savings, so went this reasoning, by foregoing the planned investment in the UK submarine industrial base and the development of a nuclear submarine manufacturing capacity at home. If the ADF were to procure only *Virginia*-class submarines, the Australian government could reduce the cost of the nuclear submarine program by an estimated \$10.9 billion by reducing its investment in major

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38 The White House, "Trilateral Australia-UK-U.S. Partnership on Nuclear-Powered Submarines," March 13, 2023, <https://www.whitehouse.gov/briefing-room/statements-releases/2023/03/13/fact-sheet-trilateral-australia-uk-us-partnership-on-nuclear-powered-submarines/>.

AUKUS Pillar I development and production initiatives. This was a significant saving for the teams' rebalancing plans.

The teams recognized such a decision would have consequences. They acknowledged a plan to procure only *Virginia*-class submarines had its own downsides, including: (a) the risk of being locked into technologies tied to an aging platform, (b) concerns about undue external interference over where and how the ADF might choose to employ its forces, (c) worries about low U.S. submarine production rates owing to limits on shipbuilding capacity, and (d) fears about how the cancellation could impact job creation at home. The teams were acutely sensitive to the potential diplomatic fallout from a decision to cancel the SSN-AUKUS program. As such, the teams considered various mitigating factors, workarounds, and new measures, including steps to use the AUKUS framework to deepen and expand trilateral cooperation, that would cushion the blow from such a decision.

In this context, it is notable that the exercise teams generally perceived the AUKUS partnership in broad terms when prompted at the workshops. Although two teams described the partnership narrowly in terms of technology sharing, the rest recognized that the trilateral arrangement provided a larger framework that tightened connections between the three partners. Several teams, for example, saw great promise in advancing interoperability, intelligence sharing, defense industrial base integration, and allied presence in each other's territories. The teams speculated that AUKUS may, in the not-so-distant future, serve as the foundation for a multilateral security framework for the Indo-Pacific that included other countries.

Although it is beyond the scope of this report to litigate the merits and drawbacks of the teams' decisions, the participants arrived at their decisions through frank exchanges of views and careful weighing of the risks and benefits. All made the decision after lengthy and thoughtful deliberations. The submarine decision was just one among dozens of major and minor choices that the teams had to make to rebalance the entire ADF under significant time pressure. The exercises and their outcomes were not predictions of policy and strategy, but the ambivalence among many participants paralleled the debates currently underway.

The contentious discussions that surrounded the AUKUS program during the workshops raise additional questions. To what extent do officials conceive of AUKUS differently? Should AUKUS be viewed as a technology-sharing arrangement or as a security partnership that includes technology sharing? What are the implications, if any, of potential gaps in allied perceptions? To what extent is the program producing a crowding-out effect within the alliance, given the time, resources, and political capital necessary to maintain the partnership's momentum? What potential opportunity costs are the program imposing on the alliance? Is there a risk that alliance managers might be overweighting the program at the expense of other pressing priorities?

## Doubling Down on Rotational Presence

All teams maximized Australia's potential to act as a hub for allied operations. Some were particularly receptive to continued rotations of U.S. Air Force bombers, especially the forthcoming B-21. Indeed, various teams expanded and improved airfields and hardened fuel storage and other facilities for the B-21s. One team agreed to split the O&M costs of U.S. B-21s deployed in Australia. Some exercise participants thought the bomber rotations could partially address the gap in the ADF's own long-range strike capabilities. They believed the rotations could bolster the credibility of U.S. extended deterrence while keeping the bombers outside the densest parts of the PLA's weapons engagement zone, areas within the range of Chinese precision-strike firepower. One team expected the United States to rotationally deploy IRBM units in Australia. Other teams funded infrastructure improvements and hardened air and naval bases to facilitate rotational deployments. One team invested heavily in coalition exercises that would take place in Australia and elsewhere.

The teams' decisions were built upon ongoing rotational allied presence, including the annual six-month rotations of U.S. Marine Corps personnel and the rotations of U.S. Air Force bombers through Australian air bases. Moreover, Australia routinely trains and exercises with American, allied, and partner forces. Talisman Sabre, for example, is a biennial multinational exercise led by Australia and the United States.<sup>39</sup> Under AUKUS Pillar I, up to four nuclear submarines are expected to rotate through HMAS Stirling starting in 2027.<sup>40</sup> The United States and Australia are cofunding the expansion of basing infrastructure elsewhere in Australia, particularly in the Northern Territory, to support the rotations of U.S. forces.<sup>41</sup>

The teams engaged in a rich discussion about current arrangements. Some teams considered the burdens of rotations, which require personnel and equipment to relocate into and out of a given place. Such moves can be disruptive because units take months to mobilize for deployment and to stand down after their tour of duty. The transportation of personnel and equipment within or across theaters can be time consuming and costly and can strain logistical capacity. Intermittent rotations can create gaps in military presence, with implications for deterrence and for the development of operational-level allied interoperability.

Some teams discussed several ways to mitigate the downsides of rotational deployments. Participants proposed continuous "heel-to-toe" rotations, in which overall U.S. force levels in Australia would stay constant even as individual units cycled in and out of country.

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39 Australian Army, "Exercise Talisman Sabre," <https://www.army.gov.au/our-work/exercises/exercise-talisman-sabre>; DoD, "Exercise Talisman Sabre," <https://www.defense.gov/Multimedia/Experience/Exercise-Talisman-Sabre/>.

40 ADoD, "Submarine Rotational Force—West Infrastructure Project," <https://www.defence.gov.au/about/locations-property/infrastructure-projects/submarine-rotational-force-west-infrastructure-project>.

41 Kirsty Needham, "U.S. Military, Seeking Strategic Advantages, Builds Up Australia's Northern Bases amid China Tensions," *Reuters*, July 26, 2024, <https://www.reuters.com/world/us-military-seeking-strategic-advantages-builds-up-australias-northern-bases-2024-07-26/>.



Others suggested leaving equipment in Australia while rotating just the personnel. Such arrangements would enhance deterrence and warfighting by ensuring capabilities were in place to be quickly called into action while minimizing transportation costs. The prepositioning of fuel, munitions, and spare parts at Australian bases would allow allied forces to obtain readily available supplies to support high-tempo peacetime and wartime operations. These propositions reflected a willingness to consider creative approaches while remaining alert to Australia's sensibilities.

The inherent flexibility of American submarines and bombers deployed in Australia, however temporarily, prompts the following questions. To what extent do the allies agree on the roles and missions of U.S. rotational forces in Australia in peace, crisis, and war? What assumptions do Australian policymakers hold about those forces that need to be interrogated? How might the uses of American forces launched from Australian bases diverge from Canberra's expectations? To what extent does the U.S. presence in Australia fill gaps in the ADF's warfighting capabilities and fulfill Canberra's operational priorities in wartime? Do Australian policymakers perceive a substitution effect in which American forces in Australia could offset the ADF's shortcomings, particularly in long-range strike?

### **An Underexplored Theme: Long-Range Strike**

Much has taken place since the two workshops in March and May 2024. The Australian discourse on defense matters has certainly advanced apace during the intervening period. Nevertheless, many topics covered during the exercises—ranging from the PLA's investments in undersea warfare and nuclear weapons to the future of Australia's defense posture—involve long-term trends that will have a lasting influence on Asian security and Canberra's strategy. For example, China's nuclear modernization and its implications for U.S. extended deterrence, including the rotational presence of American bombers, will probably become more salient and urgent over the next decade.

Another topic that will likely have enduring consequences for Australia's defense in the years to come is its plan for long-range strike capabilities. The teams devoted significant time and energy in procuring systems that would extend the ADF's offensive punch. Yet, owing to time pressure, many issues related to long-range strike weaponry were left underexamined. Given the topic's enduring importance to ADF modernization, the next chapter will offer a thought experiment for weighing the pros and cons of the various long-range strike options the teams considered.



## CHAPTER 4

# ADF Long-Range Strike Options: An Operational-Level Assessment

Australia’s policy documents have repeatedly emphasized the need for long-range firepower. The 2024 NDS called on the ADF to pursue capabilities that would generate six “key capability effects,” including “impactful projection to deter any attempts to project power against Australia.” It asserted the ADF must have the means to “hold at risk any potential adversary forces that could target our interests during a conflict, complicating their cost and risk calculus.”<sup>42</sup> One of the “capability priorities,” according to the NDS, is “targeting and long-range strike to provide a greater capacity, at longer ranges, to deter any attempts to project power against Australia.”<sup>43</sup> The IIP identifies air-, ship-, and ground-launched munitions as important elements of long-range strike. Clearly, Canberra seeks a force that can reach farther than in the past.

### Rationale for Testing Long-Range Strike Options

Reflecting Australia’s defense policy priorities and in line with the objectives stated during the ADF rebalancing exercises, the teams considered and invested in various long-range strike capabilities. One or more teams procured—or showed an interest in—long-range munitions with an emphasis on LRASMs, hypersonic weapons, IRBM units, arsenal planes, stealth bombers, surface vessels, and nuclear-powered submarines, among other options.

Not all options, of course, are created equal. Each of these long-range strike options imposes different costs and requirements. Moreover, each promises different battlefield effects,

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42 ADoD, *National Defence Strategy* (Canberra, Australia: ADoD, 2024), p. 28.

43 *Ibid.*, p. 38.

portends different escalatory dynamics, demands different types of logistical and personnel support, aligns with or diverges from a more offensive or defensive posture, enhances different types of diplomatic messaging, and so forth.

**TABLE 1: THE ADF'S PLANNED AND POTENTIAL LONG-RANGE STRIKE CAPABILITIES**

Platform	Combat Radius (nautical miles)
B-21*	3150
F-35A	590
P-8A	2150
General purpose frigate	3850 (at 15 knots)
<i>Hobart class</i>	2250 (at 18 knots)
<i>Hunter class</i>	1750 (at 15 knots)
<i>Virginia class</i>	Unlimited
IRBM*	1620-2970

Source: IHS Janes database.

Note: \* denotes systems not in the ADF program-of-record. The general purpose frigate combat radius is based off the MEKO A-200, a finalist for the RAN's general purpose frigate competition. ADOD, "General Purpose Frigate Milestone Reached with Down-Selection of Shipbuilders," November 25, 2024, <https://www.minister.defence.gov.au/media-releases/2024-11-25/general-purpose-frigate-milestone-reached-down-selection-shipbuilders>. The B-21 combat radius is based on the range of the B-2A, but the B-21 could have an even longer reach. Tyler Rogoway, "The B-21 Raider is and isn't a 'B-2 Spirit 2.0,'" *The War Zone*, January 11, 2023, <https://www.twz.com/the-b-21-raider-is-and-isnt-a-b-2-spirit-2-0>.

Although the teams did not examine in depth the various benefits, risks, and trade-offs among the menu of long-range strike options they pursued, the exercises brought to the surface different force packages the ADF could adopt in the future. Moreover, these options reveal the types of opportunity costs policymakers must contend with if they choose one or some over others. The two exercises in Washington and Canberra confirmed the trade space is especially tight for the lean ADF. Australia would need to make hard choices between options rather than pursue all or most of them. The trade-offs between options may be quite sharp.

There is therefore analytic value in assessing and balancing the strengths and weaknesses of those long-range strike options. Some options may be so expensive that they crowd out other options; others might not be sufficient to achieve "impactful projection." To advance the discourse about Australia's long-range strike capabilities, this chapter compares and evaluates the operational effectiveness of these strike options through a scenario-based analysis.

**Scenario: A Campaign Against Spratly Island Bases**

To conduct such a comparative assessment, it is necessary to posit a hypothetical—but nevertheless detailed—operational scenario against which various long-range strike options could be tested to gauge their relative efficacy. For the purposes of this study, CSBA looked at the effectiveness of potential long-range ADF strikes against PLA bases in the Spratly Islands. This scenario was meant entirely for testing operational value, though

placing at risk the island garrisons in the South China Sea has been raised as a possible mission for the ADF.<sup>44</sup>

Why might Canberra choose to attack those bases? Although there are a range of operational rationales, two plausible purposes are illustrative. First, it may be necessary for Australian forces to suppress, degrade, or knock out the PLA's A2/AD network, including its air and missile defenses, as a prelude to follow-on attacks against the infrastructure and command and control nodes on the islands. In this case, the ADF could be a part of a broader coalition campaign during which its primary role would be to kick down the door for sustained follow-on attacks by U.S. forces.

Second, the ADF may need to conduct a more thoroughgoing operation on its own to neutralize the ability of the island bases to generate long-range combat power, including surface action groups, airpower, and land-based missile forces, that could directly threaten the Australian homeland. The goal would be to deliver a series of hard blows to render those bases unusable, at least for some time. Of the two conceivable objectives, the latter—involving numerous targets—would require a greater level of effort, measured by numbers of sorties and munitions, to complete the mission.

For the purposes of this thought experiment, CSBA chose the latter option to test the relative efficacy of Australia's long-range strike options. This more challenging operation allowed CSBA to better stress test the ADF. Of course, counterattacks against enemy island strongholds are not the only scenario that might matter to Canberra. A mission involving the interception of an incoming PLAN task force approaching Australia is an equally valid if not more pressing scenario, one that many teams debated.

The South China Sea scenario was not a judgment about the likelihood of such a campaign taking place, nor was it a recommendation that Canberra should contemplate such a decision in the future. Rather, the scenario was a useful proxy for a tough real-world operational problem with which to hypothesize the relative utility of the ADF's potential long-range strike options as selected by the exercise teams.

Consider the main characteristics of the PLA's Spratly Island military outposts. These garrisons form a mutually supporting cluster that are heavily defended by land-based IAMD systems as well as air and naval forces (Figure 15). They are located some 3,000 kilometers from northern Australia. The most direct flight path to the island bases from Darwin would pass over the Indonesian archipelago. A hypothetical campaign involving long-range strikes against those bases would require overcoming at least three obstacles: enemy air and missile defenses that would heavily contest the approaches to the islands, the tyranny of distance

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44 Hugh White, for example, argued the ADF may need “to mount long-range strikes against Chinese naval forces deploying towards us or our near neighbours, or to attack Chinese forward bases in islands close to Australia.” White added, “These are certainly missions that the ADF needs to be able to undertake.” Hugh White, “Australia and B-21 Bombers: Less Bang For the Buck,” *Lowy Institute*, November 7, 2022, <https://www.lowyinstitute.org/the-interpretor/australia-b-21-bombers-less-bang-buck>.

that characterizes this theater, and the diplomatic burden of obtaining overflight rights (if conducting air strikes) from neighboring countries.

**FIGURE 15: PLA BASE ON FIERY CROSS**



**Source:** Created by CSBA using map data courtesy of Google Earth Pro V 7.3.6.9796, (May 15, 2022), Fiery Cross Reef, 9° 32' 55.75"N, 112° 53' 28.56"E, Eye alt 10833 feet, Maxar Technologies 2024, <http://www.earth.google.com>. Icon locations sourced from: CSIS, "A Constructive Year for Chinese Base Building," *Asia Maritime Transparency Initiative (AMTI)*, December 14, 2017, <https://amti.csis.org/constructive-year-chinese-building/>; CSIS, "Comparing Aerial and Satellite Images of China's Spratly Outposts," *AMTI*, February 16, 2018, <https://amti.csis.org/comparing-aerial-satellite-images-chinas-spratly-outposts/>; Shaan Shaikh, "China Installs Missile Systems in Spratly Islands," *Missile Threat*, May 4, 2018, <https://missilethreat.csis.org/china-installs-first-missile-systems-in-spratly-islands/>; CSIS, "Updated: China's Big Three Near Completion," *AMTI*, June 29, 2017, <https://amti.csis.org/chinas-big-three-near-completion/#jp-carousel-15690>.

The distances involved help test the idea of impactful projection beyond the inner arc and the near approaches to Australia. For example, whether ADF air platforms need to be refueled to strike those island bases would be a critical tactical consideration. Thinking about how such distances would impact sortie generation is another crucial analytic task. The presence of PLA assets on or near those islands helps determine how much firepower would be needed to penetrate the thicket of air and missile defenses. As such, the volume of firepower for an attacking sortie would be an important factor in calculating the operational requirements for an effective assault.

There are many potential targets on those island bases, including runways, piers, logistical facilities, fuel and ammunition depots, command centers, sensors, and barracks. The garrisons are home to naval, air, and land-based missile forces as well as air and missile defense systems and paramilitary units. Moreover, the islands probably will have some organic independent capacity to withstand strikes, conduct repairs, rearm and refuel forces, and regenerate combat sorties to continue resistance. The PLA would probably project forces from the mainland to reinforce the garrisons and conduct resupply missions to maintain the islands' defensive integrity. These factors would require any attacking force to strike and restrike the islands to achieve their operational aims, which would, in turn, call for sustained operations over some time in any planned offensive.

To fulfill the missions of this hypothetical scenario, the ADF probably would need to generate several pulses of long-range firepower, each consisting of certain quantities of

munitions, spread over weeks or months to degrade the PLA's capabilities and infrastructure on the island bases. Given these stressful operational demands, CSBA chose *payload delivery capacity*—the collective weight of warheads launched by a platform at a target—to measure the effectiveness of the ADF's long-range strike options.<sup>45</sup> Of course, payload delivery capacity is only one of the many metrics that evaluate relative efficacy. This thought experiment is meant to illustrate how policymakers could go about weighing and making choices from a menu of options.

One other intervening factor is the potential role of the United States. A combined allied campaign in which the U.S. military took part in strikes alongside Australian forces would offset many operational burdens on the ADF, including payload delivery capacity. It is conceivable that the United States could carry out the bulk of the attacks. Nevertheless, thinking through a scenario in which the ADF would conduct such a campaign on its own could yield valuable insights. Given that most if not all of the exercise teams had the inclination for Australia to possess a sovereign strike option, this experiment offers an opportunity to evaluate what a maximally independent capability might look like. Moreover, the United States could find itself overstretched in a major military contingency elsewhere, including a war over Taiwan. There is thus value in considering how Australia might conduct long-range offensives when U.S. forces might not be readily available.

## Methodology

To test the operational efficacy of long-range strike capabilities, CSBA selected systems that are already in the ADF's arsenal, that are expected to join the force, and that are currently unplanned. CSBA chose weapons that are not part of the ADF's current program-of-record based on the decisions the teams made during rebalancing exercises. In other words, CSBA drew from the two workshops to provide the parameters for the assessment below. The existing and planned capabilities include:

- F-35s and/or F/A-18s armed with LRASM or JASSM-ER, supported by aerial refueling tankers;
- P-8 maritime patrol aircraft armed with LRASM or JASSM-ER;<sup>46</sup>
- *Virginia*-class submarines armed with Tomahawk land-attack cruise missiles; and
- Destroyers and frigates armed with Tomahawk land-attack cruise missiles

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45 For more on payload delivery capacity as a measure of campaign effectiveness, see David A. Deptula and Douglas A. Birkey, *Building the Future Bomber Force America Needs: The Bomber Re-Vector* (Arlington, VA: Mitchell Institute for Aerospace Studies, September 2018), pp. 21–25, [https://mitchellaerospacepower.org/wp-content/uploads/2021/02/a2dd91\\_5475b8f668714ce0a8cfb65dob49ef95.pdf](https://mitchellaerospacepower.org/wp-content/uploads/2021/02/a2dd91_5475b8f668714ce0a8cfb65dob49ef95.pdf).

46 The P-8A is not currently integrated with the JASSM-ER, but the aircraft can carry the similarly sized LRASM. Michael Marrow, "P-8 LRASM Testing Expected to Wrap This Summer, Boeing Official Says," *Breaking Defense*, June 28, 2024, <https://breakingdefense.com/2024/06/p-8-lrasm-testing-expected-to-wrap-this-summer-boeing-official-says/>.



Unplanned capabilities the ADF could procure and the potential postures the ADF could adopt by 2035 include:

- Land-based missile batteries armed with either hypersonic or IRBMs weighing up to 1,800 kilograms,<sup>47</sup>
- B-21 bombers armed with LRASM or JASSM-ER, and
- A forward-deployed F-35 squadron armed with LRASM or JASSM-ER at a regional base within 900 nautical miles of the Spratly Islands

CSBA analyzed the payload delivery capacity of these various existing, planned, and potential systems and postures in a notional 30-day ADF campaign against the PLA's Spratly Island bases. The analysis assumed a campaign lasting 30 days to reflect the likely need to restrike the targets on the island bases if they were to meaningfully degrade or neutralize the PLA's ability to effectively project power against the Australian homeland.

### Baseline and Assumptions

CSBA first established a baseline to compare the payload delivery capacity of the ADF's current and relevant forces—meaning platforms that can fire munitions—with that of alternative forces. A baseline in this context refers to the total payload, measured in weight, the ADF can deliver using the forces in its existing and planned inventory, including F-35 fighters, F/A-18 fighters, P-8 maritime patrol aircraft, *Hobart*-class destroyers, *Hunter*-class frigates, general purpose frigates, and *Virginia*- and SSN-AUKUS submarines.<sup>48</sup>

A set of assumptions informed CSBA's calculations of the baseline and the alternative forces' payload delivery capacities. The analysis assumed one third of the RAN's surface ships and submarines in each class were available for strike missions.<sup>49</sup> For aircraft, the analysis assumed half of all aircraft types in the inventory were ready for action.<sup>50</sup> Given that the F-35 and the P-8 are multimission platforms, CSBA assumed only one third of the available aircraft would be assigned to strike, with the rest responsible for other missions, such as

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47 Weight assumption based off the Df-26. Missile Defense Advocacy Alliance, "Dong Feng-26," June 4, 2018, <https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/china/df-26/>.

48 See Appendix C for more information on baseline quantity of available platforms.

49 This is based on the U.S. Navy's goal of having "one third of our ships and attack submarines...in maintenance, one third in training, and one third on or ready for deployment." CNO, *Navigation Plan*, p. 20.

50 The B-2A, F-35A, and P-8A all have mission capable rates of about 50 percent. John A. Tirpak, "Air Force Mission Capable Rates Fall in 2023," *Air & Space Forces*, May 29, 2024, <https://www.airandspaceforces.com/air-force-mission-capable-rates-2023/>; DoD Office of the Inspector General, *Evaluation of the Readiness of the U.S. Navy's P-8A Poseidon Aircraft to Meet the U.S. European Command's Anti-Submarine Warfare Requirements* (Arlington, VA: DoD, May 21, 2021), <https://www.dodig.mil/reports.html/Article/2626880/evaluation-of-the-readiness-of-the-us-navys-p-8a-poseidon-aircraft-to-meet-the/>. This estimate roughly aligns with the proportion of aircraft the U.S. Air Force dedicated to the Gulf War. DoD, *Gulf War Air Power Survey, Volume III: Logistics and Support* (Arlington, VA: DoD, 1993), pp. 29–30, [https://media.defense.gov/2010/Sep/27/2001329815/-1/-1/0/gulf\\_war\\_air\\_power\\_survey-vol3.pdf](https://media.defense.gov/2010/Sep/27/2001329815/-1/-1/0/gulf_war_air_power_survey-vol3.pdf).



combat air patrols, ASW, ISR, and strike-package escort.<sup>51</sup> These assumptions helped impose some realistic, albeit limited, constraints due to the forces' logistics and maintenance needs and the opportunity costs of dedicating multirole systems to strike missions.

CSBA assumed a fixed proportion of strike munitions that each platform would carry in the hypothetical scenario: surface vessels were assumed to dedicate one third of their VLS cells to TLAMs, with the rest holding defensive missiles; submarines were assumed to carry only TLAMs and no torpedoes; and aircraft were assumed to carry the maximum possible amount of JASSM-ERs and no other munitions.<sup>52</sup> CSBA further assumed the munitions would be directed against stationary targets, such as runways, hangars, ships tied up at pierside, and command and control sites. The analysis thus excluded missiles designed to strike mobile targets, including the LRASMs and the Maritime Strike Tomahawks. CSBA assumed the ADF had no constraints on munitions quantities. This assumption allowed more equal comparison between systems by reducing the impact of real-world constraints on missile production.<sup>53</sup>

For ease of comparison, the analysis assumed each system would fire the entirety of its payload as soon as it got within range of its targets. Crucially, the analysis did not include losses of strike platforms or support aircraft owing to enemy defenses or counterattacks. This assumption, though unlikely in a real-world scenario, intentionally gave less survivable and shorter range aircraft, such as the P-8 and the F-35, a weighted advantage vis-à-vis the B-21 bomber, a platform not in the ADF program-of-record that was tested for this thought experiment.<sup>54</sup>

After establishing the baseline quantities of strike forces, a sortie rate model determined the number of times each platform could strike targets in the South China Sea in a 30-day period.<sup>55</sup> CSBA assumed the ADF's sea and air assets would rearm and undergo maintenance

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51 During Operation Allied Force, NATO air forces dedicated 21.5 percent of their sorties for suppressing Serbian air defenses. Eric Heginbotham, Michael Nixon, Forrest E. Morgan, Jacob I. Heim, Sheng Li, et al., *The U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power, 1996–2017* (Santa Monica, CA: RAND, 2015), pp. 127–28, [https://www.rand.org/content/dam/rand/pubs/research\\_reports/RR300/RR392/RAND\\_RR392.pdf](https://www.rand.org/content/dam/rand/pubs/research_reports/RR300/RR392/RAND_RR392.pdf). When including other targets, this proportion could feasibly reach 33 percent of aircraft dedicated for all strike missions.

52 The scenario assumed aircraft armed with air-to-air capabilities would escort the aircraft dedicated for strike.

53 Future analyses could add this crucial variable to examine the potential impact of munitions costs and shortages on ADF long-range strike operations.

54 The model always rounds quantities of available aircraft down. Because the B-21 carries significantly more payload per aircraft, this has a disproportionately negative impact on it.

55 Aircraft use a RAND sortie-rate model incorporating distance and cruise speed to determine overall travel time and subsequent maintenance time, as well as a constant turnaround time of three hours. Sortie rate per day is per 24 hours, not daylight hours. Travel time includes roughly ten minutes per aerial refueling but does not include time on station. John Stillion and David T. Orletsky, *Airbase Vulnerability to Conventional Cruise-Missile and Ballistic-Missile Attacks: Technology, Scenarios, and U.S. Air Force Responses* (Santa Monica, CA: RAND, 1999), pp. 81–84, [https://www.rand.org/content/dam/rand/pubs/monograph\\_reports/1999/MR1028.pdf](https://www.rand.org/content/dam/rand/pubs/monograph_reports/1999/MR1028.pdf). Naval vessels follow a similar model for overall travel time that assumes at least 48 hours to rearm surface ships and submarines. Tom Granger, "Reload Missile Shooters at Sea," *U.S. Naval Institute Proceedings*, July 2018, <https://www.usni.org/magazines/proceedings/2018/july/reload-missile-shooters-sea>. See Appendix C for more details.

at the major Australian bases closest to the South China Sea. In this case, aircraft flew from RAAF Base Darwin, and naval vessels sailed from HMAS Coonawarra in Darwin.<sup>56</sup> These assumptions about munitions quantities and ratios, platform availability, and basing locations were applied consistently in CSBA's analysis.

Multiplying the monthly sortie rate by the quantity of munitions carried by each platform and the warhead weight of these munitions yielded the total payload delivered against targets in the South China Sea over a 30-day campaign. Given the current pace of procurement and the assumptions above, the ADF could deliver around one million kilograms of warhead weight against PLA bases in the South China Sea in 30 days. This payload delivery capacity served as the baseline, the standard CSBA compared against alternative force structures and their payload deliveries.<sup>57</sup>

### Analyzing the Alternatives

To weigh alternative options, CSBA compared the baseline—the total payload existing ADF platforms can deliver against a target—with the payload delivery of hypothetical force structures that had more airpower. In this case, CSBA tested how much more payload a larger fleet of one aircraft type—namely, additional P-8s or additional F-35s or newly acquired B-21 bombers—could deliver compared to the baseline force. CSBA calculated the payload deliveries of new fleets of P-8A maritime patrol aircraft, F-35As, and B-21 bombers and then compared those three payload deliveries with each other and the baseline force.

The comparative analysis focused only on airpower and set aside the other long-range strike options for separate treatment for several reasons. First, CSBA excluded naval vessels from the analysis because of industrial base constraints that limit construction of major platforms.<sup>58</sup> It does not appear likely that the ADF will acquire additional combatant ships before 2035 beyond what is already planned, making it difficult to project what naval production rates may look like up to 20 years into the future. Given the timelines

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56 The ADF recently upgraded *HMAS Coonawarra* to berth large naval vessels, including submarines. ADOD, "Major Milestone Reached in Northern Bases," July 24, 2024, <https://www.minister.defence.gov.au/media-releases/2024-07-24/major-milestone-reached-northern-bases>. RAAF Base Darwin has been used as a base for large aircraft in the past, but any base hosting B-21s probably would require significant upgrades. Air Force Global Strike Command, "B-52 Lands at RAAF Base Darwin," <https://www.afgsc.af.mil/News/Photos/igphoto/2000981278/>; Marcus Hellyer and Andrew Nicholls, *Impactful Projection: Long-Range Strike Options for Australia* (Barton, Australia: Australian Strategic Policy Institute, 2022), p. 26, [https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2022-12/Impactful%20projection.pdf?VersionId=cvFyjDys7.R5\\_ZSjRURXZDgSgqpilQ9e](https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2022-12/Impactful%20projection.pdf?VersionId=cvFyjDys7.R5_ZSjRURXZDgSgqpilQ9e).

57 See Appendix C for more information on baseline quantity of available platforms.

58 See John A. Tirpak, "Northrop Grumman Eats \$1.56 Billion Loss on First B-21 Bomber Lots," *Air & Space Forces Magazine*, January 25, 2024, <https://www.airandspaceforces.com/northrop-grumman-1-56-billion-loss-b-21/>. Department of Defence's Procurement of Hunter Class Frigates (Canberra, Australia: Australian National Audit Office, 2023), p. 9, [https://www.anao.gov.au/sites/default/files/2023-05/Auditor-General\\_Report\\_2022-23\\_21a.pdf](https://www.anao.gov.au/sites/default/files/2023-05/Auditor-General_Report_2022-23_21a.pdf); Navy Virginia-Class Submarine Program and AUKUS Submarine (Pillar 1) Project: Background and Issues for Congress (Washington, DC: CRS, August 5, 2024), p. 5, <https://sgp.fas.org/crs/weapons/RL32418.pdf>.

involved in the analysis, it would have been imprudent to include ships and submarines in the comparisons.

Second, CSBA omitted land-based IRBM units from the analysis due to unit cost and operational differences. For IRBMs, the munition, rather than the platform, is the primary cost driver. The payload delivery of an IRBM unit is determined by how many missiles are available and how quickly the missiles can be reloaded into the transporter erector launchers (TELS), which are essentially reusable missile tubes mounted on trucks. The launchers are relatively cheap, but the missiles needed to arm a battery consisting of four TELS with two cells each may cost around A\$1 billion.<sup>59</sup> Because munition cost was beyond the scope of the analysis, it was not possible to engage in an apples-to-apples comparison.

Moreover, IRBMs are probably most useful during the initial phases of a campaign. A relatively small IRBM force optimized for penetrating enemy defenses could be employed to destroy limited numbers of high-value targets, such as critical command and control nodes, to open the way for follow-on attacks. Because CSBA was primarily concerned with measuring the ability of the ADF to conduct sustained strikes against a variety of targets over time, IRBMs did not fit neatly into this kind of scenario.

Third, CSBA excluded forward-based aircraft from the analysis. The cost of deploying and operating a squadron of F-35s closer to the South China Sea is much lower than the cost of acquiring and operating new aircraft. The cost in this case lies mostly in the diplomatic and political arena for overseas access and host-nation support, which was outside the scope of analysis. To capture the operational efficacy of these three alternative long-range strike options, CSBA opted to provide a separate set of analyses that follows this assessment of the hypothesized air forces.

Fourth, the exercise teams' apparent lack of interest in other air-launched long-range strike options that were available in the ADF SCT, such as arsenal planes, led CSBA to confine its analysis to the P-8s, F-35s, and B-21s. Only one team invested in the ability to use C-17 or C-130 transports to launch long-range cruise missiles in the form of palletized munitions.<sup>60</sup> Conversely, all but one team made investments or divestments related to the P-8s, the F-35s, and/or the B-21s.

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59 Includes full reload capability. US\$43 million per missile with an exchange rate of 1.48 applied. *The U.S. Army's Long-Range Hypersonic Weapon (LRHW): Dark Eagle* (Washington, DC: CRS, September 9, 2024), <https://crsreports.congress.gov/product/pdf/IF/IF11991>. Inflated into FY25\$ using Office of Management and Budget (OMB) Historical Table 10.1 available at <https://www.whitehouse.gov/omb/budget/historical-tables/>.

60 Arsenal planes can deliver long-range payloads like a bomber, but they, like the P-8, lack the survivability of the B-21 in a contested environment. Additionally, dedicating cargo aircraft to strike missions has opportunity costs—each C-17 conducting strikes is one fewer performing its primary airlift mission.

## Comparing Airpower Options

This process of elimination left CSBA with three air platforms for analysis: the P-8, F-35, and B-21. For a fair comparison among these three options, CSBA applied an equal resource amount to acquire a hypothesized fleet of P-8s, F-35s, or B-21s that would be added to the existing air force. To do so, CSBA used the SCT to estimate the resource amount needed to acquire a single B-21 squadron (12 bombers) to enter service in 2033.<sup>61</sup> CSBA then calculated how many more P-8s or F-35s could be procured and operated for the same amount used to field a B-21 squadron.

In short, CSBA expanded the ADF's air force by using the estimated cost of procuring a B-21 squadron as a proxy for a hypothetical increase in the defense budget. CSBA chose the B-21 squadron to derive the fixed resource amount because more than half of the exercise teams considered some form of investment in the stealth bombers. As noted above, those teams supported the rotational deployment of U.S. B-21s, planned to cocrew the bombers, or acquired the bombers. Again, the two workshops guided CSBA's parameters for the thought experiment.

This postulated resource amount yielded three alternative ADF air forces: one with more P-8s, one with more F-35s, and one with a squadron of B-21s. CSBA then tested the payload deliveries of these three air fleets against the PLA's bases in the South China Sea in a 30-day campaign to discern variations in firepower.

To account for the effect of O&M costs on end strength over time, CSBA tested the payload deliveries of the three hypothesized air forces in 2035, 2040, and 2045. For the thought experiment, CSBA allowed budget increases to keep pace with rising O&M costs to sustain 12 B-21 bombers from 2033 (when the fleet would be acquired) to 2045. CSBA then applied the same mounting O&M costs to keep the P-8s and F-35s in operation from 2033 to 2045. Because the P-8s and the F-35s entered service earlier than the B-21s due to their availability, they were older than the bombers by at least six years during each five-year increment. Table 2 shows the differentiated effects of the O&M burden on end strength due to this age difference. The P-8 fleet dropped from 33 aircraft in 2035 to 30 in 2040 and leveled off in 2045. Owing to much higher O&M costs, the F-35s dropped from 33 fighters in 2035 to 24 in 2040 and 20 in 2045. As end strength declined over time, so did the payload delivery for the P-8s and F-35s. Table 2 shows the escalating O&M costs of keeping

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61 A single B-21 is estimated to cost FY10 \$550 million, or \$785.49 million in FY25. Tirpak, "Northrop Grumman Eats \$1.56 Billion Loss on First B-21 Bomber Lots." Inflated using 2024 OMB Historical Table 10.1. O&M costs estimated as \$30 million per aircraft, much lower than the B-2A due to the B-21's improved low-observable coating. See Mike Stone and David Swanson, "U.S. Air Force's New B-21 Raider 'Flying Wing' Bomber Takes First Flight," *Reuters*, November 11, 2023, <https://www.reuters.com/business/aerospace-defense/us-air-forces-new-b-21-raider-flying-wing-bomber-takes-first-flight-reuters-2023-11-10/>. 2033 delivery date based on estimated B-21 production schedule. Hellyer and Nicholls, *Impactful Projection*, p. 32. The ADF may pay a different price for the B-21 and other systems depending on how many aircraft are purchased and when. See Hellyer and Nicholls, *Impactful Projection*, pp. 25–32.

a squadron of B-21s flying in five-year snapshots beginning in 2035 and the number of additional aircraft acquired.

**TABLE 2: RISING B-21 O&M COST AND QUANTITIES OF ADDITIONAL STRIKE AIRCRAFT ACQUIRED FOR THE COST OF A B-21 SQUADRON DELIVERED IN 2033**

Platform	2035 (two years B-21 O&M: A\$1.066 billion)	2040 (seven years B-21 O&M: A\$3.730 billion)	2045 (ten years B-21 O&M: A\$6.394 billion)
B-21	12	12	12
F-35A <sup>62</sup>	33	24	20
P-8A <sup>63</sup>	33	30	30

**Note:** The number of aircraft that can be acquired includes only procurement and O&M costs. The costs for personnel, munitions, and supporting infrastructure are not included, but future research including these and other associated costs could help provide a more thorough interpretation. All costs in FY25 AUD adjusted using OMB Historical Table 10.1, available at <https://www.whitehouse.gov/omb/budget/historical-tables/>. Costs were converted to AUD using an exchange rate of 1.48. This assumes deliveries are in quantities divisible by a squadron (12 aircraft) and that each delivery occurs two years after the preceding one. Final quantity and years of service are determined by the sum of procurement and O&M costs that gets closest to the budget target without exceeding it.

## Results

Figure 16 shows how much payload the three alternative ADF air forces could deliver in 30 days for the cost of a B-21 squadron acquired in 2033. The added fleets of F-35s, P-8s, and B-21s cost about the same, but the payloads vary quite significantly. Consider the payloads of 12 B-21s and 33 F-35s for a campaign in 2035. Based on the assumptions above, six B-21s and 11 F-35s were available for the hypothesized operations against the PLA bases in the South China Sea. The results are striking: the bombers delivered more than 1.2 million kilograms of ordnance above the baseline force structure, but the fighters delivered slightly more than 200,000 kilograms above the baseline. Even though the ADF acquired nearly three times as many F-35s as B-21s, the B-21 still delivered more than five times the payload of JASSM-ERs over a 30-day campaign.<sup>64</sup> Owing to the decline in end strength as rising

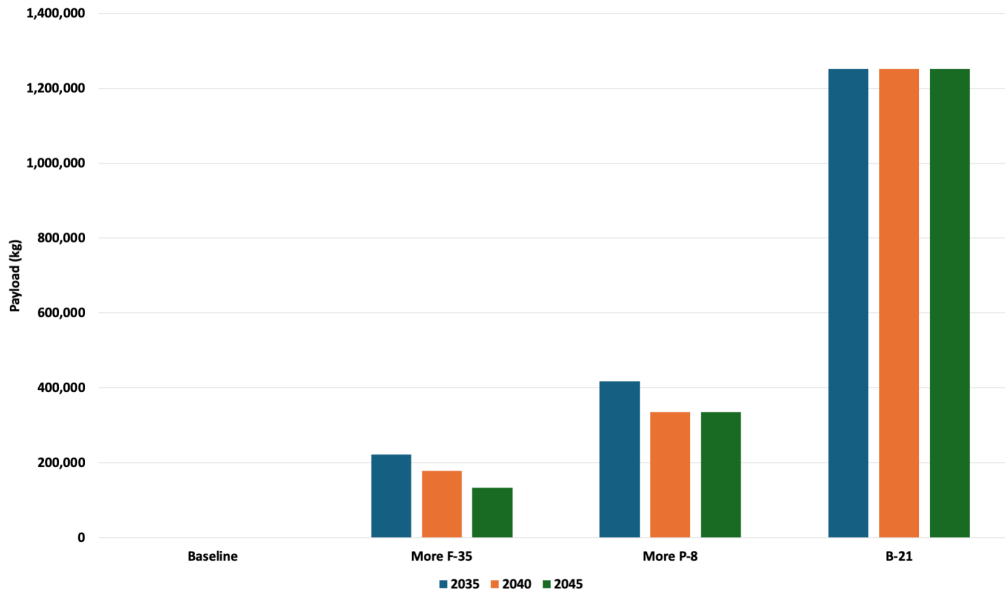
62 The F-35A has an APUC of US\$116.10. Office of the Assistant Secretary of the Air Force for Financial Management and Comptroller, *Fiscal Year (FY) 2025 Budget Estimate, Aircraft Procurement, Air Force* (Arlington, VA: Office of the Undersecretary of Defense (Comptroller) (OUSD(C)), March 2024), Volume 1–9, <https://www.saffm.hq.af.mil/Portals/84/documents/FY25/FY25%20Air%20Force%20Aircraft%20Procurement%20Vol%20I.pdf?ver=trnnCwkcSenGdKvniZvWHQ%3d%3d>. The annual O&M of an F-35A squadron is US\$434.37 million, excluding overhead costs. Congressional Budget Office (CBO), *The U.S. Military's Force Structure: A Primer, 2021 Update* (Washington, DC: CBO, 2021), p. 91, <https://www.cbo.gov/system/files/2021-05/57088-Force-Structure-Primer.pdf>. Inflated into FY25\$ using OMB Historical Table 10.1.

63 The P-8A has an APUC of US\$201.15 million. Office of the Assistant Secretary of the Navy (Financial Management and Comptroller), *Fiscal Year (FY) 2025 Budget Estimate, Aircraft Procurement, Navy* (Arlington, VA: OUSD(C), March, 2024), Volume 1–115, [https://www.secnav.navy.mil/fmc/fmb/Documents/25pres/APN\\_BA1-4\\_Book.pdf](https://www.secnav.navy.mil/fmc/fmb/Documents/25pres/APN_BA1-4_Book.pdf). The annual O&M of a P-8A squadron is US\$197.24 million, excluding overhead costs. CBO, *The U.S. Military's Force Structure: Fiscal Year 2024 Update to Personnel Numbers and Costs* (Washington, DC: CBO, November 8, 2023), Table B-2, <https://www.cbo.gov/publication/59696>. Inflated into FY25\$ using OMB Historical Table 10.1.

64 See Appendix C for more information.

O&M costs ate into procurement, moreover, the F-35s delivered progressively less payload in 2040 (about 177,000 kilograms) and 2045 (about 133,000 kilograms).

**FIGURE 16: PAYLOAD DELIVERY CAPACITY FOR COST OF ONE B-21 SQUADRON DELIVERED IN 2033**



Source: Created by CSBA.

This thought experiment shows that the B-21 delivered more payload than the other two air alternatives for roughly the same cost.<sup>65</sup> The long-range strike capacity of the B-21 was such that a single squadron delivered more payload per 30 days than the entire baseline force structure, estimated at one million kilograms. The B-21 was superior even when controlling for the survivability and range limitations of the alternatives. Using similar costs and the assumptions set forth above, three additional squadrons of tanker-dependent, less survivable P-8 aircraft delivered slightly more than half the payload of a single B-21 squadron.

Given that four of the six exercise teams canceled the SSN-AUKUS program to generate savings for other priorities, CSBA tested trading SSN-AUKUS subs for B-21 bombers.<sup>66</sup> CSBA estimated a one-time saving of roughly A\$11 billion from the submarine divestment, which would allow the RAAF to acquire and operate between six and nine B-21s,

65 In general, large aircraft with more payload and longer range are more cost effective than smaller aircraft with less payload and shorter range. See David A. Deptula and Douglas A. Birkey, *Resolving America's Defense Strategy-Resource Mismatch: The Case for Cost-Per-Effect Analysis* (Arlington, VA: Mitchell Institute, 2020), pp. 15–17, [https://mitchellaerospacepower.org/wp-content/uploads/2021/01/a2dd91\\_9eb547d3420d47bc932c95f7e949d024-1.pdf](https://mitchellaerospacepower.org/wp-content/uploads/2021/01/a2dd91_9eb547d3420d47bc932c95f7e949d024-1.pdf).

66 See Appendix C for another funding scenario based on savings gained from canceling major initiatives related to SSN-AUKUS

depending on acquisition and operating timeframes (see Appendix C). Although the smaller bomber force still delivered a much greater payload than other options at an equivalent cost, CSBA judged that the limited number of airframes would probably adversely influence the decision makers' risk calculus. Indeed, the scarcity of such exquisite and expensive assets might incline policymakers to become overly cautious about the bombers' use in a campaign. If leaders treated the bombers as if they were capital ships, akin to prestige weapons, then the B-21s would lose much of their operational relevance. As such, CSBA concluded that a submarine-to-bomber tradeoff did not add adequate analytic value to the thought experiment.

As noted in the methodology section, CSBA made assumptions that analytically favored the F-35s and P-8s, particularly regarding survivability. The following reintroduces some of those real-world risks to adjudicate the operational efficacy of the air options.

CSBA's analysis considered a likely strike package of 12 F-35 fighter aircraft armed with JASSM-ERs, which could deliver more than 500,000 kilograms of munitions over a 30-day campaign. But this option suffers from a major drawback: the vulnerability of support aircraft. The fighter's combat radius of 600 nautical miles means the F-35s would need to be refueled by relatively scarce, large-signature tanker aircraft to get within range of the Spratly Islands. Those tankers would be unlikely to survive PLA counterair operations if they were to encounter modern enemy aircraft, like the stealthy J-20, armed with long-range air-to-air missiles.

P-8s suffer from lack of survivability and capacity. These large-signature aircraft were not designed to survive combat areas contested by a capable adversary and probably would suffer grievous losses over a 30-day campaign. The PLA's long-range air defense systems and fighters armed with PL-17 or PL-21 long-range air-to-air munitions would outrange the P-8s armed with standoff missiles. The P-8s would need to come within 500 nautical miles of Spratly Island bases to launch JASSM-ERs, but J-20 fighters with PL-17 munitions exceed the range of JASSM-ERs by 184 nautical miles.<sup>67</sup>

The P-8s are also limited by capacity. A P-8 can carry four JASSM-ER-sized weapons.<sup>68</sup> Such a strike package is well suited to attack small-scale targets of opportunity, but it is too small to overwhelm and penetrate the PLA's modern IAMD systems. Similarly, two P-8s armed with eight cruise missiles may have limited effect against bases defended by a web of land-based air defense systems, fighter aircraft, and surface vessels. Moreover, countries that sit athwart the approaches to the South China Sea could deny overflight rights to the P-8s.

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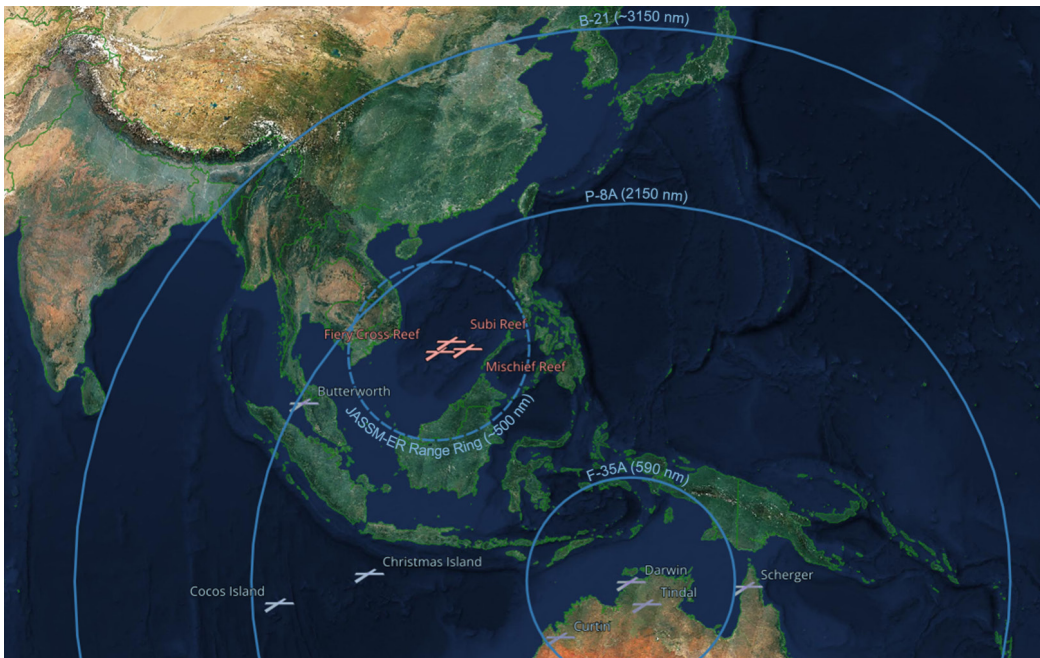
67 Caleb Egli, "Fueling a Superpower: Reprioritizing the U.S. Air Refueling Fleet for Great-Power Conflict," *Journal of Indo-Pacific Affairs* 7, no. 3, June 2024, pp. 288–304, <https://www.airuniversity.af.edu/JIPA/Display/Article/3768313/fueling-a-superpower-reprioritizing-the-us-air-refueling-fleet-for-great-power/>

68 Marrow, "P-8 LRASM Testing Expected to Wrap This Summer."



Because F-35s require aerial refueling to fulfill their strike missions, the overall cost of additional F-35s should include the necessary tanker support. If CSBA were to add tanker costs to its analysis, the overall increase in costs for additional F-35s would eat into the procurement of aircraft within the fixed budget.<sup>69</sup> The result would have been a further drop in payload delivery. Although the B-21s and P-8s technically have the range to complete a round trip to the South China Sea, they probably would require tanker support under certain circumstances. Even so, the bombers' payload capacity would still far outperform the F-35s when the cost of aerial refueling is added.

**FIGURE 17: UNREFUELED COMBAT RADII FROM RAAF BASE DARWIN**



Source: Created by CSBA. Range for all systems are from the IHS Janes database.

These findings by no means deprecate the operational value of the P-8s and F-35s. The results show that additional F-35 and P-8 aircraft provided notable increases to long-range strike capacity over the baseline. The true strength of these aircraft, however, lies in their availability. With F-35s and P-8s already in production, the ADF can acquire them much sooner than B-21s.

69 For more on the impact of the cost of supporting aircraft on strike packages, see Travis Sharp and Tyler Hacker, *Evaluate Like We Operate: Why DoD Should Evaluate Weapons Systems as Networked Force Packages, Not Individual Platforms* (Washington, DC: Center for Strategic and Budgetary Assessments, 2023).



## Assessing Other Alternatives

This section analyzes alternative long-range strike options that were excluded from the comparisons between different airpower configurations. It looks at naval combatants, land-based missiles, and forward-deployed aircraft in overseas locations.

SSNs have several advantages for long-range strike missions. They can operate undetected at great ranges over long periods and strike land, surface, and subsurface targets. In addition to striking, submarines can defend chokepoints, interdict enemy shipping, screen friendly naval forces, lay mines, insert special operations forces, and collect intelligence. They can enter and loiter in a contested operational area. They can impose virtual attrition on an adversary: their reported presence or the threat of their presence could compel an opponent to avoid certain areas or increase resources to protect its own forces.<sup>70</sup>

However, limits on payload and sortie generation as well as a small fleet size constrain the submarine option. Australia's future *Virginia*-class submarines, which will not be equipped with the *Virginia* Payload Module, could theoretically launch about 37 Tomahawk land-attack cruise missiles from its vertical launch cells and torpedo tubes.<sup>71</sup> This equates to nearly 69,000 kilograms of munitions that could be delivered against targets in the South China Sea over 30 days by a single *Virginia*-class submarine. In reality, of course, the payload delivered probably would be smaller: RAN subs would almost certainly carry torpedoes for self-defense. The vessels would also have to make a roughly one-week round trip from HMAS Coonawarra to the South China Sea and back to reload and redeploy. The expected slow growth of Australia's nuclear submarine force is another constraint. By 2035, the ADF will have at most two *Virginia*-class submarines in its inventory. This was a reason why the subs were excluded from CSBA's comparative analysis above.

Although the *Hobart*-class destroyers, *Hunter*-class frigates, and future general-purpose frigates can sail long distances and strike targets with land-attack missiles, they, too, suffer from capacity constraints. Given that they would be cruising in or near highly contested areas, as postulated in the South China Sea scenario, the ships would have to dedicate a significant portion of their VLS cells to air defense munitions, especially if they were operating beyond land-based aircover. This could crowd out the cells available to hold land-attack and anti-ship missiles, especially if the air defense variety can perform only one function. The recently announced plan to purchase SM-6 missiles, which can fulfill anti-air,

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70 Evan Montgomery, Travis Sharp, and Tyler Hacker, "Quality Has a Quality All Its Own: The Virtual Attrition Value of Superior-Performance Weapons," *War on the Rocks*, June 19, 2024, <https://warontherocks.com/2024/06/quality-has-a-quality-all-its-own-the-virtual-attrition-value-of-superior-performance-weapons/>.

71 Australia will get Block IV and VII subs, neither of which have the payload modules. Eckstein, "Here's When the U.S. Navy Plans to Sell Subs to Australia Under AUKUS;" Justin Katz, "U.S. Navy Sub Boss Reveals New Details on AUKUS *Virginia*-Class Sub Sales to Australia," *Breaking Defense*, November 8, 2023, <https://breakingdefense.com/2023/11/us-navy-sub-boss-reveals-new-details-on-aukus-virginia-class-sub-sales-to-australia/>.

anti-ship, and ballistic missile defense missions, may alleviate VLS space constraints among RAN surface combatants.<sup>72</sup>

Force generation is another limitation. Surface combatants will require days to transit from Australia to the South China Sea. CSBA estimated surface combatants would be able to launch one strike operation per week if the ships returned to Darwin for immediate resupply. In this scenario, a *Hobart*-class destroyer, a *Hunter*-class frigate, and a general-purpose frigate could deliver around 25,000 kilograms, more than 17,000 kilograms, and about 8,000 kilograms of munitions, respectively, in a 30-day campaign. Survivability would also be an issue, a factor that CSBA's analysis assumed away for the thought experiment. Obviously, these warships probably would be vulnerable once they entered the PLA's weapons engagement zone.

Another prospective long-range strike option is IRBM batteries. During the ADF rebalancing exercises, two teams chose to codevelop an IRBM with the United States and the United Kingdom. Given its range and speed, an IRBM would enable the ADF to promptly strike fixed and mobile targets throughout Australia's primary area of operations. If based in northern Australia, a hypothetical IRBM comparable to the PLARF's DF-26 with a maximum range of 4,000 kilometers could place at risk PLA surface combatants at sea and bases in the South China Sea. An IRBM's high reentry speed is valuable for penetrating the IAMD systems that protect PLA bases and other high-value targets, such as command and communications nodes. Furthermore, road-mobile IRBMs could leverage the island continent's vastness to avoid enemy detection and counterstrikes, thereby shoring up survivability.

As noted above, the IRBMs' operational value lies in their ability to deliver devastating first blows against a small number of critical targets to set the stage for sustained, follow-on strikes by other platforms. A relatively modest land-based missile force may be adequate for such a role. As such, payload capacity delivered over time is probably not a meaningful measure of the IRBMs' relative efficacy. A more relevant metric may be the initial salvo size and its expected effectiveness against a few vital enemy assets.

Yet another option is to position combat forces near the likely scene of action and maintain their readiness through expeditionary sustainment. Two exercise teams in Canberra expanded the ADF's overseas presence, with one of them choosing to build an expeditionary airfield. The RAAF currently maintains a peacetime forward presence of P-8 aircraft at Royal Malaysian Air Force Base Butterworth for maritime security operations.<sup>73</sup>

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72 Noah Robertson, "Australia Announces \$4.7 Billion Purchase of U.S. Air Defense Missiles," *Defense News*, October 22, 2024, <https://www.defensenews.com/global/asia-pacific/2024/10/22/australia-announces-47-billion-purchase-of-us-air-defense-missiles/>.

73 Rifle Company Butterworth is excluded because its purpose is base protection and training rather than offensive operations.

CSBA assessed hypothetical forward basing of ADF combat units along Australia's northern approaches and the South China Sea. It concluded the RAAF's F-35 fighter aircraft appears to offer the most economical and feasible option for a wartime scenario. Its analysis considered forward basing 12 F-35s, about one sixth of Australia's F-35A fleet, and arming them with JASSM-ERs.<sup>74</sup>

Forward-based strike aircraft can be a relatively affordable way to increase payload delivery. Because CSBA's sortie rate model relied on distance traveled to determine maintenance time, forward basing F-35s can significantly increase sortie rates, thereby ramping up payload delivery. CSBA found that an F-35 squadron operating from a hypothetical base located 900 nautical miles from the Spratly Islands could deliver around 816,000 kilograms of munitions over 30 days, a more than 50 percent increase over a squadron based in Darwin.

Overseas basing has, however, several drawbacks. It is subject to host-nation consent. Forward-based forces need protection and sustainment. At minimum, air and missile defenses would be needed to shield the airbases. To sustain operations like the 30-day campaign envisioned in this scenario, combat forces would require stockpiles of munitions, fuel, and spare parts as well as secure supply lines running back to the homeland. CSBA's analysis assumed logistics and maintenance would meet the needs of forward-based F-35s. In a real-world campaign, though, payload delivery would probably drop due to complex sustainment constraints as well as enemy actions, including counterattacks against the forward bases and interdiction against supply lines. A Chinese riposte would be especially damaging because those forward bases, some 900 nautical miles from the Spratly Islands, would fall within the PLA's weapons engagement zone.

## Some Preliminary Findings

These results yield some tentative findings about Australia's long-range strike options. First, neither the current ADF force structure nor the one expected in the early 2030s is optimized for conducting a campaign against PLA bases in the South China Sea. The two *Virginia*-class subs that would join the force a decade from now would be inadequate to generate enough payload delivery against heavily defended garrisons. Surface combatants would also struggle to produce enough mass to overcome enemy defenses. Short-legged F-35s would be dependent on vulnerable refueling tankers, and the P-8s would not survive in the high-intensity combat scenario postulated for this thought experiment. Indeed, expected losses to enemy interdiction might outweigh the theoretical increase in payload delivery from acquiring more F-35s and P-8s.

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74 These F-35s could be based on a rotational or permanent basis. For CSBA's operational-level payload delivery analysis, the F-35s were considered present for the duration of a full 30-day campaign. The cost implications of different forward basing arrangements are addressed separately below.

Second, unplanned capabilities and postures, including B-21 bombers, IRBM units, and forward-deployed F-35s, would contribute substantially to a strike campaign against Spratly Island bases, but they would come with significant liabilities. B-21 bombers and IRBMs are expensive, and acquiring them would require either a major increase in defense resources or divestments from the AUKUS program. The B-21 is still a fledgling program, and the IRBMs, especially at the ranges considered for this study, are not even on the drawing board. Moreover, institutional, bureaucratic, cultural, political, and diplomatic barriers might stand in the way of adopting radically new capabilities, especially given the importance and attention accorded to AUKUS. An expeditionary F-35 squadron's operational value would depend on the whims of host nations, and it would be exposed to withering Chinese fire-power if deployed inside the PLA's weapons engagement zone. Power projection over long distances is difficult for even the largest and most advanced militaries. As such, these unplanned capabilities and postures could help the ADF address the inherent challenges of long-range strike.

Third, impactful projection is a relative concept that remains open to interpretation. For the purposes of this study, CSBA took impactful projection to mean options that would enable the ADF to conduct deep strikes against well-defended targets far from Australian shores. This is an admittedly maximalist understanding of the idea. There are more modest versions of impactful projection, one of which could be the ability to interdict and neutralize incoming threats along the inner arc and the approaches to the Australian homeland. That interpretation would be in line with the choices the teams made during the ADF rebalancing exercises. The offensive-defense postures the teams adopted would meet less demanding operational requirements consistent with this moderate understanding of impactful projection. There may thus be value in viewing impactful projection as a spectrum of expectations about the ADF's long-range strike capabilities. This chapter shows one method for testing those expectations.

This analysis and its results are by no means the final word on this subject. There are many ways to measure efficacy. Moreover, operational inputs and outcomes must be weighed against other calculations, not least of which is politics. This analysis shows that a transparent, rigorous methodology underwritten by explicit assumptions can inform decisions about Australia's long-range strike options. It represents a point of departure for further debate.

## CHAPTER 5

# Conclusion

As Chapter 1 made clear, a main intent of the workshops in Washington and Canberra was to introduce interaction—a key ingredient to strategy—by structuring the PLA and the ADF rebalancing exercises as an action-reaction sequence. In other words, the participants rebalanced the ADF based on their earlier decisions about the PLA's force structure over a ten-year period. This ordering of events ensured the exercise team members had the Chinese military in mind as they considered options for the ADF. The interrelated character of the themes that emerged from the PLA and ADF exercises, as summarized in Chapter 3, demonstrates how such interaction paid analytic dividends for the project.

One crosscutting theme is that longstanding asymmetries that have favored the alliance are beginning to fade. Chinese investments in long-range firepower, ASW, and nuclear weapons have challenged—or ought to challenge—assumptions about Australia's sanctuary status, allied undersea dominance, and U.S. extended deterrence and nuclear superiority. The PLA's reach and forward presence in the South China Sea, for example, have meant that the distance separating Australia from the epicenter of great power competition to the north no longer offers the margin of safety that it used to. Similarly, the anticipated Chinese advances in ASW might require the allies to rethink concepts of undersea operations.

Another crosscutting theme is that the teams' choices regarding the ADF's future force structure reflected the results of the PLA rebalancing exercises and the PLA's real-world challenges to Australia and the United States. The teams' decisions to invest in sensors to better monitor Australia's surroundings, in long-range weaponry to place enemy forces at risk at greater distances than before, and in air and missile defenses to enhance the ADF's capacity to intercept incoming threats had much to do with keeping the adversary at arm's length and hardening Australia's shell. The expectation among some teams that the United States would rotationally deploy B-21s shows that extended deterrence remains a cornerstone of the alliance.

Still another crosscutting theme concerns the assumptions underlying the teams' decisions. Some of these assumptions, if proven wrong, could have worrisome if not dire consequences for Australia's defense. First, Xi and his subordinates, owing to a range of influences, might be on a much shorter timetable than many presume. A more urgent PLA schedule might outpace the long lead times necessary for the allies to field next-generation forces and thereby shore up deterrence. Second, the PLA might go global much faster than anticipated. It might succeed in such an endeavor even as it maintains a credible counter-intervention posture closer to home. That outcome probably would require the alliance to hedge against the PLA's ability to pose a multiaxis threat to Australia. Third, the PLA might expand its theater-range nuclear forces, including new missiles that can reach Australia, at a scale that far exceeds current estimates. Such a nuclear breakout would erode U.S. extended deterrence not just in Northeast Asia but across the Indo-Pacific, demanding allied consultations and arrangements related to the American nuclear umbrella over Australia that have hitherto been unnecessary.

The final theme is the perpetual tension between the ADF's lean force structure—and the limited trade space within that structure—and the costs associated with acquiring systems that would best fulfill the needs of impactful projection. The teams that sought to obtain an offensive-defense posture were compelled to cannibalize their air and ground forces and modify their submarine programs to achieve the desired outcomes. Put another way, the exercises repeatedly demonstrated what it would take, in terms of discipline and painful sacrifice, to achieve the teams' stated aims. Moreover, the sharp trade-offs necessary to acquire additional capabilities with significant reach and operational leverage, like bombers, would be self-defeating under current fiscal realities.

The operational efficacy of bombers demonstrated in Chapter 4 must be balanced against the high premiums, financial or otherwise, that accompany them. In the context of the exercises, those premiums were the trade spaces they would occupy within the fixed ADF force structure and the proportional number of existing capabilities that would need to give way to the bombers' introduction. Based on CSBA's cost-informed estimate, Australia will probably only be able to go big on one major acquisition program for power projection—submarines, bombers, or IRBMs—given current and expected budgetary trends. It is plausible that Canberra could opt for some combination of smaller forces that included submarines, bombers, and land-based missiles, but the risk is that each option would be so scaled down that it would not be able to either generate meaningful combat power or absorb losses. Such are the constraints given the ADF's leanness.

These crosscutting themes also offer guidance for future ADF-related SCEs. The two rebalancing exercises in Washington and Canberra were open ended in terms of force modernization. The teams were free to redesign their forces however they wished. Future exercises could be tailored and structured to address certain trendlines or potential outcomes. The teams could be instructed to follow specific guidance about force structure decisions. The mock Central Military Commission in a PLA rebalancing exercise could direct

the participants playing the role of Chinese defense planners to pursue specific aims. The teams' performance would then be judged by how closely they hewed to the directive.

To challenge the assumption that the CCP would be largely reactive about Taiwan, the teams could be asked to prepare their forces to conquer the island by the end of the second five-year move. To challenge the assumption that the PLA would be fixated on regional contingencies, the teams could be ordered to build a global force within the decade. To challenge the assumption that China's nuclear modernization would stay the course, the teams could be tasked to attempt a strategic and theater nuclear breakout to sprint toward parity with the United States. In an interactive exercise, the participants playing the role of the ADF would be directed to rebalance their forces in response to the PLA's radical shifts in priorities to generate further discussion and debate.

Throughout the two workshops, the roles of the United States and other security partners were never far from the participants' minds. Animated debates about U.S. rotational presence in Australia; the degree to which Canberra should count on certain American capabilities, including C4ISR and the defense industrial base; the potential utility of ADF forward presence in the region; and so forth demonstrated the centrality of the alliance and regional relationships to Australia's strategy. To carry forward the insights generated by this study's exercises, future SCEs could be structured to include the United States and other partners. For example, a rebalancing exercise that paired the U.S. SCT with the Australia SCT would help explore in greater depth the allied division of labor over roles and missions in peacetime and war. An exercise involving the Japan SCT and the Australia SCT would create opportunities to discuss how the northern and southern anchors of the region's security architecture could best collaborate to bolster deterrence.

The PLA rebalancing exercises showed that the security environment is expected to worsen, perhaps markedly, in the coming years and decades. Given the anticipated reach of China's future conventional and nuclear forces, Australia will be drawn closer to the action than ever before. Moreover, the allies can no longer take their advantage and superiority for granted. The ADF rebalancing exercises further demonstrated that even more difficult and painful trade-offs lay ahead for Canberra as it strives to develop a focused force capable of impactful projection. Short of an expansion in defense resources, Australia's choices may be more limited than many presume, with implications for allied deterrence and warfighting. In sum, much intellectual heavy lifting and policy work remains to be done.





## APPENDIX A

# China SCT Default Force Structure, 2024–2034

This appendix contains the PLA's baseline force structure from 2024 to 2034 in the SCT. The baseline does not attempt to predict the PLA's force structure; rather, it serves as a starting point for users to modify during the SCEs.<sup>75</sup>

## PLA Navy<sup>76</sup>

Platform	2024	2029	2034
Aircraft carriers	2	4	5 (1 CVN)
Cruisers	8	16	24
Destroyers	43	47	49
Frigates	51	60	68
Patrol/coastal combatants	156	139	128
SSBNs	6	8	10
SSNs	9	12	19
SSKs	44	49	56
Principal amphibis	11	18	22

<sup>75</sup> For more information, see Bianchi et al., *China's Choices*, pp. 71–72.

<sup>76</sup> CSBA estimated PLAN ship inventory by consulting various sources: the IHS Janes database; International Institute for Strategic Studies (IISS), *The Military Balance* 124, no. 1 (Oxfordshire, UK: IISS, 2024), pp. 256-59; Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress* (Washington, DC: CRS, 2023).

## PLA Air Force and Naval Aviation<sup>77 78</sup>

Platform	2024	2029	2034
Bombers	228	230	245
5th-gen fighters	281	724	1142
4th-gen fighters	1359	1355	1261
AEW&C/ISR/EW	145	203	268
Tankers	27	57	78
Transports	276	374	469

## PLAGF<sup>79 80</sup>

Units	2024	2029	2034
Heavy CABs	33	33	33
Medium CABs	18	18	18
Light CABs	24	24	24
Air assault brigades	2	2	2
Amphibious assault brigades	6	6	6
Border defense brigades	31	31	31
Artillery brigades	15	15	15
Coastal artillery brigades	19	19	19
Mountain infantry brigades	15	15	15
Aviation brigades	13	13	13
Special operations brigades	15	15	15

77 Western fighter aircraft generations are used in this table.

78 CSBA estimated PLAAF and PLAN naval aviation inventories by consulting various sources: IHS Janes database; IISS, *The Military Balance*, pp. 259–60; Rod Lee, “PLA Naval Aviation Reorganization 2023,” *China Aerospace Studies Institute*, July 31, 2023, <https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/PLAN/2023-07-31%20PLAN%20Aviation%20Reorg%202023%20Clean.pdf?ver=N848BtqfMRRjojcS2ThCtw%3d%3d>; Rick Joe, “China’s J-20 Gets Another Upgrade,” *The Diplomat*, August 1, 2023, <https://thediplomat.com/2023/08/chinas-j-20-gets-another-upgrade/>; Eric Tegler, “China is Finally Seeking Fighter Pilots with College Degrees,” *Forbes*, September 27, 2023, <https://www.forbes.com/sites/erictegeler/2023/09/27/china-is-finally-seeking-fighter-pilots-with-college-degrees/?sh=45b864eb45c6>; Andreas Rupprecht (@Rupprecht\_Deino), “Well, seems to be less than a quarter of the annual production of Y-20/YY-20 at XAC I estimate to be at more than 12-if not close to 20-per year,” *X* (formerly *Twitter*), December 9, 2023, <https://x.com/RupprechtDeino/status/1733551517326561634>.

79 IISS, *The Military Balance*, pp. 255–56, 260.

80 The PLA has a limited number of independent divisions outside of CABs. The SCT converts these divisions into brigade equivalents for ease of use.

**PLARF<sup>81</sup>**

Type	Units	2024	2029	2034
ICBM	DF-5A/B/C	3	4	5
	DF-31A	2	0	0
	DF-31A(G)	5	7	8
	DF-41	3	5	5
IRBM	DF-26	7	8	8
MRBM	DF-16	3	4	5
	DF-21A/E	2	2	2
	DF-21C/D	2	2	2
SRBM	DF-11A/DF-15B	2	0	0
SRBM	CJ-10/A/CJ-100	3	3	3
HGV	DF-17	3	4	4

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81 CSBA estimated PLARF unit inventory by consulting various sources: IISS, *The Military Balance*, p. 254; Hans M. Kristensen, Matt Korda, Eliana Johns, and Mackenzie Knight, "China Nuclear Weapons, 2024," *Bulletin of the Atomic Scientists*, 80, no. 1, 2024, p. 59.



## APPENDIX B

# Australia SCT Default Force Structure, 2024-2034

The following tables show the baseline ADF force structure from 2024 to 2034 in the SCT. Like Appendix A, this appendix is not intended to predict the ADF force structure in ten years. Instead, it gives participants in the SCEs a baseline they can modify as they make their choices in the SCT.

## RAN<sup>82</sup>

Platform	2024	2029	2034
Destroyers	3	3	3
Frigates	7	6	11
Patrol/coastal combatants	11	16	16
SSNs	0	0	1
SSKs	6	6	6
Principal amphibis	3	3	3

82 CSBA estimated RAN ship inventory by consulting various sources: IHS Janes database; IISS, *The Military Balance*, p. 247; ADoD, *Defence Portfolio Budget Statements 2023–24* (Canberra, Australia: ADoD, 2023), p. 124; ADoD, *Enhanced Lethality Surface Combatant Fleet*; Eckstein, “Here’s When the U.S. Navy Plans to Sell Subs to Australia Under AUKUS;” Howard Altman, “Everything We Know About the Future SSN-AUKUS Submarine’s Configuration,” *The War Zone*, March 15, 2023, <https://www.thedrive.com/the-war-zone/everything-we-know-about-the-future-ssn-aucus-nuclear-submarines-configuration>.

**RAAF<sup>83</sup>**

Platform	2024	2029	2034
5 <sup>th</sup> -gen fighters	72	72	72
4 <sup>th</sup> -gen fighters	24	24	24
AEW&C/ISR/EW	33	36	36
Tankers	7	7	7
Transports	30	30	30

**Australian Army<sup>84</sup>**

Platform	2024	2029	2034
Armored cavalry regiment	3	2	2
Mechanized infantry battalion	3	1	1
Infantry battalion	3	5	5
Artillery regiment	3	3	3
Amphibious battalion	1	1	1
Special air service regiment	1	1	1
Commandos regiment	2	2	2

83 CSBA estimated RAAF inventory by consulting various sources: IHS Janes database; IISS, *The Military Balance*, pp. 247–48; ADoD, *Defence Portfolio Budget Statements 2023-24*, pp.116–17, 119; Tyler Rogoway, “USAF Wants More Airlift Capacity But with C-17 out of Production What Could It Provide?,” *The War Zone*, June 5, 2019, <https://www.twz.com/24542/usaf-wants-more-airlift-capacity-but-with-c-17-out-of-production-what-could-provide-it>; ADoD, “Multibillion Dollar Investment in New C-130J Hercules Aircraft,” July 24, 2023, <https://www.minister.defence.gov.au/media-releases/2023-07-24/multibillion-dollar-investment-new-c-130j-hercules-aircraft>.

84 IISS, *The Military Balance*, p. 246.

## APPENDIX C

# ADF Spratly Island Strike Campaign Model Assumptions and Inputs

This appendix contains more information on the hypothetical ADF strike campaign against PLA bases in the Spratly Islands.

### **Baseline Forces for Strike Missions When Including Availability Assumptions**

The table below shows the number of platforms available for an ADF strike campaign against PLA bases in the Spratly Islands. This table differs from the force structure tables found in Appendix B because it only shows the platforms available for strike missions under the model's assumptions rather than the total inventory of platforms. The analysis assumes 50 percent of all aircraft are ready to fly at any time. Of this 50 percent, only 33 percent of F/A-18s, P-8As, and F-35As are available for strike, with the other two thirds conducting separate missions, including escorting the strike package. One third of the ships and submarines in each class in the inventory are available for strikes, with the other two thirds either winding down after a previous mission or preparing to replace a ship at sea.

Platform	2035	2040	2045
F/A-18	4	0 <sup>85</sup>	0
F-35A	12	12	12
P-8A	3	3	3
Hunter class	1 <sup>86</sup>	1	2
Hobart class	1	1	1
General purpose frigate	1 <sup>87</sup>	3 <sup>88</sup>	3
Nuclear-powered attack submarine <sup>89</sup>	0	1 <sup>90</sup>	2 <sup>91</sup>

### Inputs for the Stillion and Orletsky Sortie Rate Model

In *Airbase Vulnerability to Conventional Cruise-Missile and Ballistic-Missile Attacks: Technology, Scenarios, and U.S. Air Force Responses*, John Stillion and David T. Orletsky created a model to measure aircraft sortie rates. To find the daily sortie rate (SR), divide 24 hours by the sum of flight time (FT), turnaround time (TAT), and maintenance time (MT) for the formula  $SR = \frac{24 \text{ hours}}{FT + TAT + MT}$ .

Where  $FT = 2X \frac{\text{distance to target}}{\text{average cruise speed}}$ ,  $MT = 3.4 \text{ hours} + 0.68FT$ , and TAT is a constant of 3.<sup>92</sup>

85 Expected to retire in mid-2030s. Malcolm Davis, “The Super Hornet Flies On,” *The Strategist*, July 19, 2023, <https://www.aspistrategist.org.au/the-super-hornet-flies-on/>.

86 First delivered in 2032 with subsequent deliveries occurring every other year. Julian Kerr, “Questions Emerge over Australia’s Hunter-Class Frigate Programme,” *Janes*, May 12, 2023, <https://www.janes.com/defence-news/news-detail/questions-emerge-over-australias-hunter-class-frigate-programme>; ADoD, “Hunter-Class Frigate,” <https://www.defence.gov.au/defence-activities/projects/hunter-class-frigate>.

87 First delivered in 2030. Kerr, “Questions Emerge over Australia’s Hunter-Class Frigate Programme.”

88 This assumes same commissioning rate as *Mogami*-class frigate of one every two to three years. IHS Janes database.

89 Includes both *Virginia*-class and SSN-AUKUS SSNs.

90 Three *Virginia*-class in service by 2038. Eckstein, “Here’s When the U.S. Navy Plans to Sell Subs to Australia under AUKUS.”

91 This assumes at least two AUKUS SSNs delivered in early 2040s, so possibly three SSN-AUKUS delivered by mid 2040s. Altman, “Everything We Know about the Future SSN-AUKUS Submarine’s Configuration.” Only one AUKUS SSN included in 2045 for the scenario where SSN-AUKUS gets cancelled.

92 Stillion and Orletsky, *Airbase Vulnerability to Conventional Cruise-Missile and Ballistic-Missile Attacks*, pp. 81–84.



Factor	F-35A	P-8A	B-21	F/A-18	Hunter	Hobart	General purpose frigate	SSN
Distance to target (km) <sup>93</sup>	2222	2222	2222	2222	1539	1539	1539	1539
Avg. cruise speed (km/h)	942.6	844	820.7	856	29.6 <sup>94</sup>	29.6	29.6	46.3 <sup>95</sup>
Travel time (hrs) <sup>96</sup>	5.35	5.43	5.41	5.83	103.99	103.99	103.99	66.48
Turnaround time (hrs) <sup>97</sup>	3	3	3	3	48 <sup>98</sup>	48	48	48
Maintenance time (hrs)	7.04	7.09	7.08	7.37	-	-	-	-
Sortie rate per day	1.56	1.55	1.55	1.48	0.18	0.18	0.18	0.21
Sortie rate per 30 days <sup>99</sup>	46	46	46	44	5	5	5	6

## Munitions Information<sup>100</sup>

### JASSM-ER and TLAM Specifications

Munition	Range (km)	Warhead weight (kg)
JASSM-ER	926	453.6
TLAM	1610	313

93 All straight-line distances. Range of JASSM-ER or TLAM subtracted from the distance between RAAF Base Darwin (12.413478° S, 130.877096° E) or HMAS Coonawarra (12.458611° S, 130.821667° E) and Fiery Cross Reef (9.554803° N, 112.894301° E). Coordinates from IHS Janes database.

94 This assumes average steaming speed of 16 kts for surface vessels.

95 This assumes SSNs travel below top speed to maintain stealth, so average cruise speed estimated as 25 kts.

96 This assumes ten minutes per aerial refueling, with each aircraft refueling at end of maximum range.

97 Turnaround time includes the various actions required before taking off. It includes landing, taxiing, rearming, refueling, and queuing to take off. The Stillion and Orletsky model is based on the F-15 and F-16, so total turnaround time may differ for the B-21A, F/A-18, F-35A, and P-8A.

98 Naval vessels can take as many as two days to reload in port. Granger, "Reload Missile Shooters at Sea."

99 Rounded to exclude fractions of a sortie.

100 All information from HIS Janes database unless noted otherwise.

**Quantity of JASSM-ER or TLAM Carried by Each Platform Included in the Analysis**

Platform	Munitions per platform
F-35A	2 <sup>101</sup>
P-8A	4 <sup>102</sup>
F/A-18	2 <sup>103</sup>
B-21	10 <sup>104</sup>
Hunter class	11 <sup>105</sup>
Hobart class	16 <sup>106</sup>
General purpose frigate	5 <sup>107</sup>
Nuclear-powered attack submarine <sup>108</sup>	37 <sup>109</sup>

**Alternative Spratly Islands Strike Campaign With Savings from Canceling Major SSN-AUKUS Initiatives as Budget Constraint**

The table and graph below show the payload delivery capacity of alternative air forces bought with the savings gained from cancelling major SSN-AUKUS initiatives. CSBA estimates the Australian Department of Defence can save about A\$10.9 billion by canceling

101 Center for Strategic and International Studies (CSIS), “JASSM/JASSM-ER,” *Missile Threat*, April 23, 2024, <https://missilethreat.csis.org/missile/jassm/>.

102 It is not confirmed whether the P-8A can carry the JASSM-ER; however, it can carry up to four similarly sized LRASMs. Xavier Vavasour, “First View of LRASM Missile Aboard a U.S. Navy P-8A Poseidon,” *Naval News*, April 4, 2023, <https://www.navalnews.com/event-news/sea-air-space-2023/2023/04/first-view-of-lrasm-missile-aboard-a-us-navy-p-8a-poseidon/>.

103 CSIS, “JASSM/JASSM-ER.”

104 This assumes the B-21 will have between 50 and 75 percent of the B-2A’s payload capacity. Ben Ho Wan Beng, “The B-21’s Possible Future Role in Maritime Strike,” *Breaking Defense*, January 20, 2023, <https://breakingdefense.com/2023/01/the-b-21s-possible-future-role-in-maritime-strike/#:~:text=Tellingly%2C%20the%20LRASM%20loadout%20of,of%2016%20LRASMs%20%5BPDF%5D>. The B-2A can carry up to 16 JASSM-ER missiles. CSIS, “JASSM/JASSM-ER.”

105 The *Hunter* class has 32 VLS cells. Nigel Pittaway, “Australia’s Anti-Submarine Frigate Program Sails Rough Seas,” *Defense News*, December 21, 2023, <https://www.defensenews.com/naval/2023/12/21/australias-anti-submarine-frigate-program-sails-rough-seas/>. This assumes one third are dedicated to strike and the other two thirds to self-defense.

106 The *Hobart* class has 48 VLS cells. Royal Australian Navy, “*HMAS Hobart* (III),” <https://www.navy.gov.au/capabilities/ships-boats-and-submarines/hmas-hobart-iii>. This assumes one third are dedicated to strike and the other two thirds to self-defense.

107 Based on the Japanese *Mogami* class, which has 16 VLS cells. Kosuke Takahashi, “Japan’s *Mogami*-Class Frigates Will Start Getting VLS in FY 2024,” *Naval News*, March 15, 2024, <https://www.navalnews.com/naval-news/2024/03/japans-mogami-class-frigates-will-start-getting-vls-in-fy-2024/>. This assumes one third are dedicated to strike and the other two thirds to self-defense.

108 Assumes both *Virginia* class and *AUKUS* class have similar capabilities and carry only TLAM, no torpedoes.

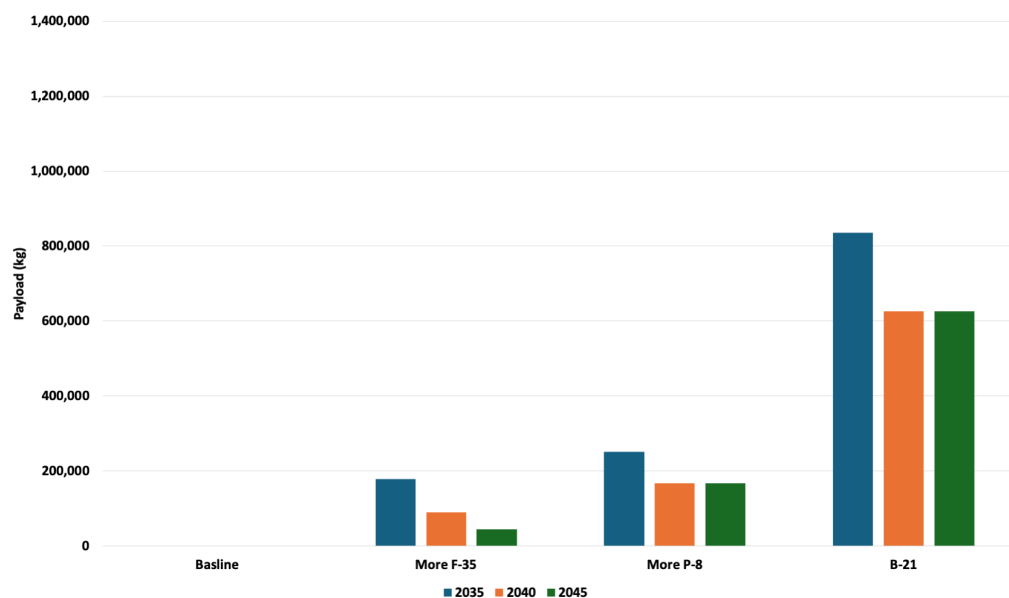
109 CRS, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress* (Washington, DC: CRS, March 31, 2023), p. 10, <https://crsreports.congress.gov/product/pdf/RL/RL32418/234>.

major SSN-AUKUS programs.<sup>110</sup> All assumptions presented in Chapter 4 apply to this alternate analysis. Notably, the B-21 still outperforms the F-35s and the P-8s in 2035, 2040, and 2045, even with much less funding than in the scenario laid out in Chapter 4.

### Additional Strike Aircraft Acquired with Savings from Canceling Major SSN-AUKUS Initiatives

Platform	2035 (A\$10.900 billion)	2040 (A\$10.900 billion)	2045 (A\$10.900 billion)
B-21	9	6	6
F-35A	24	16	12
P-8A	24	18	16

### Payload Delivery Capacity Obtained through the Savings Gained from Canceling Major SSN-AUKUS Initiatives



Source: Created by CSBA.

110 This includes canceling an A\$6 billion investment in Australia's domestic submarine industrial base. Australian Submarine Agency, "Construction in South Australia," October 2, 2024, <https://www.asa.gov.au/aucus/construction-south-australia>. This also includes a A\$5 billion investment in the UK submarine industry. Andrew Greene, "British Industry to Receive Nearly \$5 Billion from Australia to Help Build Nuclear-Powered Submarines in Adelaide," *Australian Broadcasting Corporation*, March 21, 2024, <https://www.abc.net.au/news/2024-03-22/nuclear-submarines-program-to-include-5-billion-uk-spend/103618512>. This assumes a cancellation fee of 2 percent, a similar penalty as what was paid to France for canceling the *Attack*-class submarine deal. "AUKUS: Australia to Pay €555m Settlement to French Firm," *BBC*, June 11, 2022, <https://www.bbc.com/news/world-australia-61770012>.

## LIST OF ACRONYMS

A2/AD	Anti-access/area denial
ADF	Australian Defence Force
ALBM	Air-launched ballistic missile
AUKUS	Australia–United Kingdom–United States
ASW	Anti-submarine warfare
C4ISR	Command, control, communications, computers, intelligence, surveillance, and reconnaissance
CAB	Combined arms brigade
CCP	Chinese Communist Party
CSBA	Center for Strategic and Budgetary Assessments
CVN	Nuclear-powered aircraft carrier
DSR	Defence strategic review
FY	Fiscal year
HACM	Hypersonic attack cruise missile
IAMD	Integrated air and missile defense
ICBM	Intercontinental-range ballistic missile
IIP	Integrated investment program
IRBM	Intermediate-range ballistic missile
JASSM-ER	Joint air-to-surface missile—Extended range
LHA	Landing helicopter assault ship
LOSV	Large optionally crewed surface vessel
LPD	Amphibious transport dock
LRASM	Long-range anti-ship missile
LST	Landing ship tanks
MRBM	Medium-range ballistic missile
NDS	National defence strategy
O&M	Operations and maintenance
PLA	People's Liberation Army
PLAAF	People's Liberation Army Air Force
PLAGF	People's Liberation Army Ground Force
PLAN	People's Liberation Army Navy
PLARF	People's Liberation Army Rocket Force
PRC	People's Republic of China
PrSM	Precision Strike Missile
RAAF	Royal Australian Air Force

RAN	Royal Australian Navy
SCE	Strategic choices exercise
SCT	Strategic choices tool
SLOC	Sea line of communication
SSBN	Strategic ballistic missile submarine
SSN	Nuclear-powered attack submarine
TASM	Tomahawk Anti-Ship Missile
TEL	Transporter erector launcher
THAAD	Terminal high-altitude area defense
TLAM	Tomahawk land-attack missile
UUV	Unmanned underwater vehicle
VLS	Vertical launch system









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